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REPORT TITLE

SOURCE ROCK EVALUATION OF WELL 30/6-1

CONTRACTOR

STATOIL

CONTRACTORS REF.:	JOB. NO.:
E. Lie	

SCIENTIST	DATE	PROJECT NO.
M.Bjorøy, T.M.Rønningsland, J.O.Vigran	12.11.79	0-224/1-79
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	M. Bjorøy	

SUMMARY On the basis of light hydrocarbon measurements, the analysed sequence is divided into nine zones:

A: 1490-1750m: Poor potential as a source rock for oil and gas, immature.

B: 1750-1948m and C: 1948-2056m: Good potential as a source rock for oil and gas, immature. Migrated biodegraded hydrocarbons in lower part.

D: 2056-2182m: Fair potential as a source rock for oil and gas, moderate mature

E: 2182-2533m: Rich potential as a source rock for oil and gas, moderate mature. Migrated hydrocarbons in lower part.

F: 2533-2605m: Mainly sand.

G: 2605-2731m: Fair potential as a source rock for oil and gas, moderate mature. Migrated hydrocarbons in lower part.

H: 2731-3154m: Mainly sand, moderate mature.

I: 3154-3180m: Poor potential as a source rock for gas, moderate mature to mature.

KEY WORDS

Source rock

EXPERIMENTAL

One ml. of the headspace gas from each of the cans was analysed gas chromatographically for light hydrocarbons. The results are shown in Table Ia. The canned samples were washed with temperated water on a 0.125 mm sieve to remove drilling mud and thereafter dried at 35^{o}C.

Light Hydrocarbons

Aliquotes of the samples were dried at room temperature after washing and sieving. The cuttings with a grain size between 1 and 2 mm were used for light hydrocarbon determination. These were treated with 6N HCl in a closed evacuated system, thereafter flushed with water and the released gas analysed gas chromatographically. The results are shown in Table Ib.

Total Organic Carbon (TOC)

The various selected samples were crushed on a centrifugal mill and sieved. The portions with a particle size between 0.125 mm and 0.063 mm were used in the further work. Aliquotes of the samples were treated with hot 6N HCl to remove carbonate and washed twice with distilled water to remove traces of HCl, then placed in a vacuum oven at 50^{o}C, evacuated to 20 mm Hg for 12 hrs. The samples were then analysed on a Leco E C 12 carbon determinator, to determine the total organic carbon (TOC).

Extractable Organic Matter (EOM)

From the TOC results samples were selected for extraction. Of the selected samples, approximately 100 gm of each was extracted on soxhlet apparatus for 48 hrs using dichloromethane (DCM) as solvent. The DCM used as solvent was distilled in an all glass apparatus to remove contaminants. The paper thimbles used in the soxhlet apparatus were previously washed with DCM on a large soxhlet apparatus for 48 hrs. to remove any soluble components.

Activated copper foil was used in the flasks to remove any free sulphur from the samples.

After extraction, the solvent was removed on a Buchi Rotavapor and transferred to a 50 ml flask. The rest of the solvent was then removed and the amount of extractable organic matter (EOM) determined.

Chromatographic Separation

The extractable organic matter (EOM) was separated on chromatographic columns, packed with silica, Riedel & Hähn, 0.063 mm, using the slurry method with hexane as solvent. On top of the silica, small amounts of alumina, approximately 2 cm, was added. The EOM, after it was "taken up" on alumina, was transferred to the top of the columns, which were then eluted with predistilled hexane, benzene and methanol using a ratio of 200 ml of each solvent pr. gm of EOM.

The various eluants were removed on a Buchi Rotavapor and the samples transferred to vials and dried at 40^{o}C in a stream of dry nitrogen, and the amount of the various fractions, saturated, aromatic and NSO fraction (Nitrogen, Sulphur, Oxygen), determined. The saturated fractions were analysed gas chromatographically on a 25 m OV 101 glass capillary column with He as carrier gas (0.7 ml/min.) using the splitless injection technique. The glass capillary column was mounted in a Carlo Erba F V 2150 gas chromatograph.

Vitrinite Reflectance

Samples, taken at various intervals, were sent for vitrinite reflectance measurements at Geoconsultants, Newcastle-upon-Tyne. The samples were mounted in Bakelite resin blocks; care being taken during the setting of the plastic to avoid temperatures in excess of 100^{o}C. The samples where then ground, initially on a diamond lap followed by two grades of corundum paper. All grinding and subsequent polishing stages in the preparation were carried out using isopropyl alcohol as lubricant, since water leads to the swelling and disintegration of the clay fraction of the samples.

Polishing of the samples was performed on Selvyt cloths using three grades of alumina, 5/20, 3/50 and Gamma, followed by careful cleaning of the surface.

Reflectance determinations were carried out on a Leitz M.P.V. microphotometer under oil immersion, R.I. 1.516 at a wavelength of 546 nm. The field measured was varied to suit the size of the organic particle, but was usually of the order of 2 micron diameter.

The surface of the polished block was searched by the operator for suitable areas of vitrinitic material in the sediment. The reflectance of the organic particle was determined relative to optical glass standards of known reflectance. Where possible, a minimum of twenty individual particles of vitrinite was measured, although in many cases this number could not be achieved.

Processing of Samples for Evaluation of Visual Kerogen

The rock samples were crushed and afterwards treated with hydrochloric and hydrofluoric acids to remove the minerals. A series of microscopic slides was mounted in glycerine jelly:

T-slide represents the total acid insoluble residue.
O-slide represents the residue screened through 15 sieves.
N-1,2,3 slides contain palynodebris remaining after flotation ($Zn\ Br_2$) to remove disturbing heavy minerals.
X-1,2,3 slides contain oxidized residues, when oxidizing is required due to high coalification or much sapropel.

T & O slides are necessary to evaluate kerogen composition/palynofacies which is closely related to sample lithology.

Screened slides are normally required to consentrate the larger fragments, and to study palynomorphs (pollen, spores and dinoflagellates) for paleodating and colour evaluation.

So far visual evaluations of kerogen have been undertaken from residues mounted in glycerine jelly, and studied by Leitz Dialux in normal light (halogene) using x10 and x40 objectives.

Rock-Eval Pyrolyses

100 mg crushed sample was put into a boat whose bottom and cover are made of sintered steal and analysed on a Rock-Eval pyrolyser.

RESULTS AND DISCUSSION

Light Hydrocarbons

As reported by telephone, some of the cans, especially towards the lower part of the well, had open lids due to a faulty canning machine. This will effect the light hydrocarbon data for these samples both in amount and composition. We will, however, since the sampling intervals were very close, use the light hydrocarbon data in dividing the well into zones.

On the basis of the light hydrocarbon results, the analysed sequence of the well will be divided into nine zones:

A : 1490 - 1750 m
B : 1750 - 1948 m
C : 1948 - 2056 m
D : 2056 - 2182 m
E : 2182 - 2533 m
F : 2533 - 2605 m
G : 2605 - 2731 m
H : 2731 - 3154 m
I : 3154 - 3180 m (T.D.)

The analysis show a large variation both in abundance of light hydrocarbons and in the wetness of the gas while the iC_4/nC_4 ratio is relatively stable throughout the whole analysed sequence.

A: 1490 - 1750 m: A poor abundance of both C_1 - C_1 and C_5+ hydrocarbons. The gas is dry while the iC_4/nC_4 ratio is low.

B: 1750 - 1948 m: The abundance of both C_1 - C_4 and C_5+ hydrocarbons increases sharply at 1750 m compared with zone A, while the wetness of the gas shows an increase with increasing depth. The abundance of C_5+ hydrocarbons decreases sharply at 1900 m, but this sequence is not separated out as a separate zone.

C: 1948 - 2056 m, and D: 2056 - 2182 M: The abundance of both C_1 - C_4 and C_5+ hydrocarbons are classified as good for both these zones and vary only slightly between the zones. Zone C is separated out because of the gas wetter in this zone than in zone D.

E: 2182 - 2533 m: The abundance of C_1 - C_4 and C_5+ hydrocarbons and the wetness of the gas vary considerably from sample to sample in this zone, and it is believed this might be due to sampling procedure since a systematic variation is not recorded. The zone has a good abundance of light hydrocarbons, and the gas is relativly wet.

F: 25 - 2605 m: The abundance both of C_1 - C_4 and C_5+ hydrocarbons drops sharply in this zone compared to the general trend in zone E, while the gas is rather wet.

G: 2605 - 2731 m: The abundance, especially of the C_5+ hydrocarbons increases in the zone compared to zone F, while the wetness of the gas shows a general decrease.

H: 2731 - 3154 m: The abundance of the C_1 - C_4 hydrocarbons increases sharply in this zone compared to the zone above. The first sample, 2731 - 2740 m has a very large abundance of C_1 - C_4, especially C_1. The abundance of C_5+ does not show the same increase. This indicates reservoired gas in the upper part of this zone. The abundance varies greatly from sample to sample, probably due to sampling procedure, especially since we here have sandstone which easily loses the gas.

I: 3154 - 3180 m (T.D.): The three last samples are separated out from the zone above because of the drop in abundance of C_1 - C_4 hydrocarbons and a sharp increase in the wetness of the gas.

Total Organic Carbon (TOC)

A: 1490 -1750 m: Mainly a good abundance of organic carbon, but decreasing towards the lower end of the zone.

B: 1750 - 1948 m: The upper part of the zone has a fair abundance of total organic carbon, which increases sharply in the middle of the zone, and decreases again towards the lower end.

C: 1948 - 2056 m: The abundance of organic carbon is good showing a decreasing effect with increasing depth.

D: 2056 - 2182 m: This zone shows a fair abundance of organic carbon increasing slightly towards the lower end.

E: 2182 - 2533 m: The main part of this zone is found to have a fair abundance, increasing with increasing depth. The lower part of the zone shows a good and rich abundance.

F: 25 - 2605 m: This zone consists mainly of sand. The shale samples in the zone are found to have a good abundance of organic carbon.

G: 2605 - 2731 m: The abundance of organic carbon in this zone is found to be of approximately the same level as zone F.

H: 2731 - 3154 m: This zone consists mainly of sand and only a very few samples are analysed for total organic carbon. These do, however, show a fair abundance.

I: 3154 - 3180 m: The three samples in this zone show a fair abundance.

Extractable Organic Matter (EOM) and Chromatographic Separation

A: 1490 - 1750 m: One sample, 1580 - 1610 m was extracted from this zone, showing a poor abundance of extractable hydrocarbons. The gas chromatogram of the saturated hydrocarbon fraction is typical for an immature sample with a high CPE value and a large sterane hump.

B: 1750 - 1948 m: Five samples from this zone were extracted, all showing a rich abundance of extractable hydrocarbons. Some of the samples, especially 1876 - 85 m and 1894 - 1903 m have a hydrocarbon to TOC ratio of more than 10 %, which indicates migrated hydrocarbons. The gas chromatograms of the saturated hydrocarbon fraction of these samples plus sample 1924 - 1930 are typical for biodegraded oils. This interval corresponds well with the interval where large amounts of C_1 - C_7 hydrocarbons were detected, and it is therefore assumed that this interval, 1875 - 1930 m is contaminated by migrated, biodegraded oil.

C: 1948 - 2056 m: Two samples were extracted from this zone showing a rich and good abundance of extractable hydrocarbons. The HC/TOC ratio is high, which indicates migrated hydrocarbons. The gas chromatograms of the saturated hydrocarbon fractions are different from the samples from the zone above in that the n-alkanes are much more pronounced. The isoprenoids are, however, pronounced than normally in samples of this maturity. These patterns would then indicate that the biodegradation is not as severe as in the samples from the zone above.

D: 2056 - 2182 m: Three samples were analysed from this zone, all showing a good abundance of extractable hydrocarbons. The gas chromatograms of the saturated hydrocarbon fraction all show a smooth front biased distribution typical for well matured samples.

E: 2182 - 2533 m: Eight samples from this zone were extracted, all showing a rich abundance of extractable hydrocarbons, with a maximum between 2200 and 2300 m. These samples, i.e. between 2200 and 2300 m have a high HC/TOC ratio which indicates migrated hydrocarbons. The gas chromatograms of the saturated hydrocarbon fractions are all, except sample 2506 - 15 m very similar to the two samples in the zone above. Sample 2506 - 15 m shows a very distinct sterane hump. On the basis of these analysis, we assume samples in the upper part of this zone to be contaminated by migrated, well matured oil, while the "true" extract from the rock has a large input of steranes, which indicate low maturity.

F: 2533 - 2605 m: One sample, 2569 - 78 m, was extracted, and is found to have a good abundance of extractable hydrocarbons. The gas chromatogram of the saturated hydrocarbon fraction shows a large input of heavy n-alkanes with a high CPI value. This indicates an input from immature terrestric material.

G: 2605 - 2731 m: Two samples from this zone were extracted, both showing a rich abundance of extractable hydrocarbons. The HC/TOC ratio is rather high, which indicates migrated hydrocarbons. The gas chromatograms of the saturated hydrocarbon fractions show a bimodal distribution. It is believed that the front end mode, which shows a smooth distribution, is mainly due to migrated hydrocarbons, while the back end mode, mainly a sterane hump is due to the "true" material in the shale.

H: 2731 - 3154 m: Two samples were extracted from this zone, both showing a good abundance of extractable hydrocarbons. The gas chromatograms of the saturated hydrocarbon fractions are typical for immature/moderate mature sediments with high pristane/n-C_{17} ratios and high CPI values.

I: 3154 - 3180 m: One sample, 3163 - 72 m was extracted, showing a poor abundance of extractable hydrocarbons. The gas chromatogram of the saturated hydrocarbon fraction varies slightly from the samples in the zone above in that the pristane/nC_{17} drops to below 1.0, apart from that it is very similar.

Vitrinite reflectance

Twentyfive samples were analysed for vitrinite reflectance. In the following each sample is described, and together with the reflectance data, other information from the analyses are given.

1490 - 1520 m: Shale, R_o = 0.38 (22).
The sample has a low organic content apart from a large quantity of bitumen wisps. A few wispy particles of vitrinite are recorded together with a trace of reworking. UV light shows a yellow and light orange fluorescence from spores and a low exinite content.

1670 - 1700 m: Light calcareous shale, R_o = 0.39 (19).
The sample has a very low organic content with occasional bitumen staining and wisps. Only a trace of vitrinite particles. UV light shows a light orange fluorescence from spores and a low exinite content.

1840 - 70 m: Light shale, R_o = 0.45 (20).
The sample contains a large amount of bitumen wisps, but otherwise a low organic content with vitrinite wisps and wispy particles. No inertinite or reworked material are recorded. UV light shows a yellow - light orange fluorescence from spores and a low exinite content.

1894 m: Light shale, R_o = 0.30 (3) and R_o = 0.56 (2).
Most of the sample is barren while a small portion contains a large amount of bitumen wisps and occasional vitrinite particles. Only a trace of organic material overall. UV light shows a yellow/orange and light

orange fluorescence from spores, and a low exinite content. The measurement is probably on bitumen and reworked particles and highly uncertain.

1951 m: Shale, R_o = 0.44 (10).
The sample has a low organic content with bitumen wisps and traces of wispy particles of poor quality vitrinite, and particles of inertinite. UV light shows a yellow - light orange fluorescence from spores and a low exinite content.

1997 m: Calcareous shale, R_o = 0.30 (8), 0.61 (1).
The sample has a low organic content with bitumen wisps and particles. The differentiation between vitrinite and bitumen is difficult, and the results are doubtful. UV light shows a yellow - light orange fluorescence from spores and a low to moderate exinite content.

2051 m: Shale, R_o = 0.43 (4).
The sample, which is rather pyritic, has a large amount of bitumen, wisps and staining, otherwise only a trace of small particles of vitrinite and inertinite. UV light shows a high light orange fluorescence from spores and a low exinite content. The spread in the four vitrinite readings is large (0.31 - 0.59 %), and the result very doubtful.

2095 m: Shale, R_o = 0.48 (9) and R_o = 0.67 (8).
The sample has only a trace of organic material with a few small particles of inertinite and vitrinite. The lowest reflectance material was measured, and even this was mostly reworked. UV light shows a possible very faint deep orange red fluorescence from spores, and a trace of exinite.

2145 m Pyritic shale, R_o = 0.43 (5).
The sample has a very low content of inertinite and reworked particles with only a trace of vitrinite wisps and wispy particles. UV light shows a light orange fluorescence from spores and a low exinite content.

2193 m: Calcareous shale, R_o = 0.44 (14) and R_o = 0.84 (1).
The sample has a low organic content with some bitumen staining and occasional particles of vitrinite and inertinite. Mostly reworked material. UV light shows a yellow/orange - mid orange fluorescence from spore specks and hydrocarbon impregnation together with a trace of exinite.

2207 m: Calcareous shale, R_o = 0.40 (2), R_o = 0.71 (3) and R_o = 1.00 (5).
The sample has only a trace of organic material apart from occasional bitumen staining. A few small particles of reworked material and inertinite. Two particles of possible true material. UV light shows a mid orange fluorescence from spores and a trace of exinite.

2270 m: Shale, R_o = 0.39 (22).
The sample is moderate to rich in organic material. Particles of inertinite and reworked material dominate, but a large quantity of particles and wisps of vitrinite are recorded. An overall bitumen staining is seen. UV light shows a mid orange fluorescence from spores and a moderate exinite content.

2308 m: Shale and coal, R_o = 0.43 (2).
The sample is moderate to rich in organic material with loose coal fragments, vitrinitic and dirty. The shale contains mostly particles of inertinite and reworked material with a trace of wisps and wispy particles of vitrinite. UV shows a mid orange fluorescence from spores and a rich exinite content.

2393 m: Calcareous shale, R_o = 0.38 (22).
The sample has a moderate organic content. Mostly particles of inertinite and reworked material with subordinate particles of vitrinite. Some bitumen staining is recorded. UV light shows a light and mid orange fluorescence from spores and a moderate to rich exinite content.

2456 m: Calcareous shale, R_o = 0.36 (21).
The sample has a low organic content with a little bitumen staining. Occasional particles of inertinite and reworked material with some wisps and wispy particles of vitrinite. UV light shows a light to mid orange fluorescence from spores and a moderate exinite content.

2535.5 m: Shale, R_o = 0.48 (22).
The sample has a low organic content with bitumen wisps and wisps and particles of vitrinite. Subordinate particles of inertinite and reworked material. UV shows a light to mid orange fluorescence from spores and low - moderate exinite content.

2602 m: Shale, R_o = 0.50 (21).
The sample has a low to moderate organic content with wisps of bitumen. Small particles of inertinite and reworked material with about equal proportions of wispy particles of vitrinite and bitumen. UV light shows a light to mid orange fluorescence from spores and a moderate exinite content.

2685 m: Sandy siltstone, R_o = 0.42 (20) and R_o = 0.72 (1).
The sample has a low organic content with bitumen wisps and a few small wispy particles of vitrinite while no inertinite is recorded. UV light shows a light orange fluorescence from spores and hydrocarbon traces together with a low exinite content.

2711 m: Calcareous shale, R_o = 0.49 (19).
The sample has a low organic content with bitumen wisps locally developed. A few wisps of vitrinite and particles of reworked material and inertinite. UV light shows a light to mid orange fluorescence from spores and a low exinite content.

2840 m: Calcareous shale. No determination possible.
The sample has a low organic content with a few very gnarled, degraded organic particles suggest effect of incipitent oxidation destroying organic material. UV light shows a possible mid orange fluorescence from spore specks and a possible trace of exinite.

2961.5 m: Light shale. No determination possible.
No organic material was located. UV light shows a light orange fluorescence from specks of possible spores, and a possible trace of exinite.

3014 m: Shale. No determination possible.
The organic material is very gnarled and degraded. A few particles with high reflectance - oxidized. Most of the organic material is replaced by iron oxides. UV light does not show any fluorescence.

3124 m: Red siltstone, R_o = 0.33 (1), R_o = 0.69 (2) and R_o = 0.95 (1).
The sample is virtually barren. Only four small particles are located, probably all reworked. UV light does not show any organic fluorescence.

3156.3 m: Red shale, R_o = 0.58 (1).
The sample is virutally barren, only one organic particle is located. UV light shows a mid orange fluorescence from spore specks and a trace of exinite.

3172 - 3181 m: Mixed shale lithologies, R_o = 0.42 (20) and R_o = 1.03 (2).
The organic material is restricted to the less haematic cuttings. Wisps and wispy particles of vitrinite and occasional reworked particles. An overall low organic content. UV light shows a light to mid orange fluorescence from spores, and a low exinite content.

Visual evaluation of kerogen

Kerogen studies of this well are based on 25 samples, supported by 72 samples processed for investigation of palynology. The kerogen composition apparantly remained unchanged for long intervals, and the colour index varies mainly due to lithological control. The results have been given for intervals. The actual samples, also used for vitrinite reflectance measurements, are listed in Table VIII and Fig. 5.

1490 - 1894 m: Four samples from this interval are dominated by sapropel, which tends to form aggregates.
Colour index: 2-, somewhat uncertain due to the very small size of the individual particle, and probably increased due to presence of limestone. An immature formation with potential for oil and gas generation.

1951 m SWC: This sample is also completely dominated by sapropel, but is distinguished due to the severe microbial activity indicated by hyphae and spores of fungi.
Colour index: 2/2+, a to high estimate based upon badly preserved material influenced by limestone. Potential for oil and gas.

1997 m SWC - 2207 m: Sapropel is dominant in all samples but decreases to 50 % or less at 2145 m. Reworked terrestric material is recorded, namely from 2051 m to 2207 m.
Colour index: 2, an immature to moderate mature formation with potential for oil and gas generation. The colour of the organic residues seems partly increased due to lithological control.

Remark: At 2145 m the residue contains considerable amounts either of reworked, highly coalified material or of mud additives.

2242 SWC - 2270 m: Amorphous material continues to dominate, but samples from this interval are distinguished from those above by presence of abundant undissolved minerals.
Colour index: 2/2+ an immature formation with potential for oil and gas generation.

2275 SWC - 2281 m: Amorphous material dominates, but there is 30 - 50 % of terrestric material and, in addition, undissolved minerals. Considerable "staining" and sapropelization is observed in the residues.
Colour index: 2/2+ and 2+/3 an immature to moderate mature formation with potential for oil and gas generation.

2283 SWC - 2306 m: Amorphous material dominates. The interval is distinguished from that above by aggregates of sapropel. The lowest part of this interval yielded residues dominated by undissolved minerals.
Colour index: 2/2+ or 2+ due to lighologic control. An immature to moderate mature formation, which seems to contain little organic material, but has potential for formation of oil and gas.

2308 SWC - 2405 m kj.: Terrestrial material dominate several samples and reworked material is commonly observed.
Colour index: 2/2+ to 2+/3-, variable partly due to oxidation, partly to a lithology containing limestone. An immature to moderate mature formation with potential for gas and oil formation.

2412 m to 2488-9 m: Amorphous finely dispersed material and cysts dominate. The sapropel forms aggregates.
Colour index: 2+. An immature to moderate mature formation with potential for oil formation.

2509 - 12 m to 2646 m SWC: Amorphous material fully dominates all samples but one, 2592.0 m SWC, which contains about 40 % land derived material. Undissolved minerals remain in most samples.
Colour index: 2+/3-, probably increased due to lithologic control. An immature to moderate mature formation with potential for oil and gas formation.

2653 - 56 m to 2711 m SWC: Amorphous material dominates. Good cyst assemblages are present.
Colour index: 2+/3-, a moderate mature interval with potential mainly for oil formation.

2737 - 40 m to 2821 - 4 m: Residues are dominated by terrestric material, dominantly woody structures and coaly material.
Colour index: 2+/3-. A moderate mature formation, but it is impossible to desice from colour whether the organic material is indigenous in this lithology. Possibilities for formation of gas.

2839 m SWC to 2865 m SWC: Amorphous finely dispersed material dominates and tend to be found in aggregates.
Colour index: 3/3+, to hight index due to lithologic control (limestone). A moderate mature formation which seems poor in organic content. Potential for oil formations.

2887 - 90 m to 2932 -32 m: An interval where terrestric material is equally important with sapropel.
Colour index: 2+/3-. A moderate mature formation. The material seems oxidized, but has potential for oil and gas formation.

2961.5 m SWC: No organic residue, indeterminate.

2983 - 83 m to 3188 - 66 m: Undissolved minerals are dominant in samples from this interval. Aggregates of sapropel are present.
Colour index: 2+ and 2+/3-, a moderate mature formation. Remark: The interval seems poor in organic matter. The aggregates of sapropel may be derived from downfall.

3172 - 75 m: Almost exclusively mineral matter. The organic material is dominantly woody, with a minor portion of indeterminate herbaceous matter and some sapropel, which may be derived from downfall.
Colour index: ?3+.

Rock-Eval Pyrolysis

Fiftyfive samples were pyrolysed on a Rock-Eval instrument. The T_{max} values are all of low which agrees well with the vitrinite reflectance and visual kerogen data which also indicate low maturity.

From the vitrinite reflectance data, it is known that a large proportion of the samples contain large amounts of reworked material. This will influence the Rock-Eval results in that the hydrogen index will normally be lower than for true material, while the oxygen ratio normally increases. When this is taken into consideration, there are only two intervals in the analysed sequence which can be classified as potential source rock for oil, i.e. 1850 - 2050 m and 2450 - 2730 m except, of course, for the sand lenses in these intervalls.

CONCLUSION

On the background of the various analyses the following conclusion might be drawn.

The analysed section of the well can be divided into nine zones:
A: 1490 - 1750 m, B: 1750 - 1948 m, C: 1948 - 2056 m, D: 2056 - 2182 m, E: 2182 - 2533 m, F: 2533 - 2605 m, G: 2605 - 2731 m, H: 2731 - 3154 m, and I: 3154 - 3180 m.

In our evaluation of the well, the richness rating is based on the abundance of light hydrocarbons, total organic carbon and extractable hydrocarbons. The maturation rating is based on the vitrinite reflectance, the colour of the kerogen and the T_{max} in the Rock-Eval pyrolysis, while the type of source rock is based on the type of kerogen, with results both from the visual kerogen study and the Rock-Eval pyrolysis.

The analysed sequence of the well is found to be immature down to 2050 m and moderate mature for the rest of the well. There is a slight increase in maturity for the lower 50 - 100 m, and this interval might be classified as moderate mature to mature.

On the basis of the various analyses the following rating will be given:

A: 1490 - 1750 m:
This zone has a poor potential as a source rock for hydrocarbons. Visual kerogen shows the zone to contain mainly amorphous material while Rock-Eval measurements give a high oxygen index and low hydrogen index which indicate type III kerogen. This contradiction in results could be due to a large amount of reworked material which distorts the Rock-Eval measurements more than the visual kerogen measurements.

B: 1750 - 1948 m and C: 1948 - 2056 m.
These two zones can be given the same rating, and they are found to have a good to rich potential as a source rock for oil and gas, but immature. The richness rating might be somewhat high due to migrated hydrocarbon, especially in the lower part. These migrated hydrocarbons are found to be biodegraded on the basis of the gas chromatograms of the saturated hydrocarbon fraction, which have large unresolved envelopes and almost free of n-alkanes.

D: 2056 - 2182 m.
This zone, which is found to be moderate mature, is found to have a fair to good potential as a source rock for hydrocarbon. Again a contradiction is found between the Rock-Eval pyrolysis and the visual kerogen examination, which we believe is due to large amounts of reworked material. Therefore, the "true" material in this zone is believed to be a source rock for oil and gas.

E: 2182 - 2533 m.
This zone, which is found to be moderate mature, shows the same contradictions in the upper part as the zone above, while the lower part shows a far larger hydrogen index. The whole zone will therefore be rated to have a rich potential as a source rock for oil and gas. The lower part of the zone is found to contain migrated hydrocarbons, which do not show any signs of biodegration.

F: 2533 - 2605 m.
This zone contains mainly sand and a source rock evaluation is therefore not performed.

G: 2605 - 2731 m.
This zone is found to have a fair to good potential as a source rock for oil and gas. Migrated hydrocarbons are registered in the lower part of the zone.

H: 2731 - 3154 m.
This zone contains large sequences of sand which contain migrated light hydrocarbons. Thin shale sequences have a poor to fair potential as source rock for gas. The whole zone is found to be moderate mature.

I: 3154 - 3180 m.
This zone, which is found to be moderate mature to mature, has a poor potential as a source rock for gas.

TABLE Ia

Concentration (µl gas/kg rock) of C_1 - C_7 hydrocarbons

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K694	1490 - 1520	2807	21	30	7	10
K695	1520 - 1550	1158	19	37	10	12
K696	1550 - 1580	1169	49	69	16	17
K697	1580 - 1610	553	26	52	12	15
K698	1610 - 1640	540	19	29	18	24
K699	1640 - 1670	398	12	19	22	26
K700	1670 - 1700	281	1	5	16	24
K804	1724 - 1700	OPEN LID				
K805	1730 - 1750	682	106	100	96	213
K806	1750 - 1780	16009	1897	2248	375	1170
K807	1790 - 1820	282042	43401	43249	11354	28897
K808	1810 - 1840	18712	2409	2722	416	1302
K809	1840 - 1849	38219	8743	10955	1253	5394
K810	1849 - 1858	30005	12003	14280	3338	7053
K811	1858 - 1867	44199	18036	24149	5703	13347
K812	1867 - 1876	75084	22579	23387	5297	11202
K813	1876 - 1885	22927	9132	12878	2785	7058
K814	1885 - 1894	29735	9127	13565	3564	8494
K815	1894 - 1903	15664	4933	7576	1678	4526
K816	1903 - 1912	11527	2412	3851	631	2218
K817	1912 - 1921	10183	2240	3387	509	1876
K818	1921 - 1930	3496	1533	3683	887	2841
K820	1930 - 1939	1117	422	561	114	270
K821	1939 - 1948	8904	3268	4099	793	1988
K822	1948 - 1957	3392	1687	1733	308	703
K823	1957 - 1966	5169	4499	7172	1654	4076

in headspace

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
99	2875	68	2.36	0.64
65	1235	77	6.25	0.83
55	1320	152	11.48	0.94
43	658	105	15.93	0.76
45	631	91	14.47	0.77
30	476	79	16.47	0.82
42	327	47	14.27	0.67
402	1196	514	42.98	0.45
260	21700	5690	26.22	0.32
2218	408945	126903	31.03	0.39
168	25560	6848	26.79	0.32
3644	64564	26345	40.80	0.23
4619	66680	36674	55.00	0.47
2086	105433	61235	58.08	0.43
8888	137550	62466	45.41	0.47
619	54779	31853	58.15	0.39
3470	64485	34750	53.89	0.42
3541	34377	18713	54.44	0.37
427	20639	9111	44.15	0.28
1604	18195	8012	44.03	0.27
1352	12440	8944	71.90	0.31
52	2484	1367	55.03	0.42
3482	19052	10148	53.26	0.40
693	7824	4432	56.65	0.44
7230	22570	17401	77.10	0.41

Sample	Depth (m)	C_1	C_2	C_3	iC_4
K824	1966 - 1975	6241	3190	4583	1058
K825	1975 - 1984	7383	4591	8424	2174
K826	1984 - 1993	8179	4562	7405	1811
K827	1993 - 2002	2870	1343	1982	491
K828	2002 - 2011	5053	1934	3298	902
K829	2011 - 2020	7766	2457	3217	738
K830	2020 - 2029	18709	8398	11957	2822
K831	2029 - 2038	18978	9262	11234	2351
K832	2038 - 2047	15093	9396	14462	3318
K833	2047 - 2056	12276	8556	14319	3355
K834	2056 - 2065	4985	2292	3624	847
K835	2065 - 2074	4825	1608	2441	612
K836	2074 - 2083	8661	2887	4274	1106
K837	2083 - 2092	1822	703	1079	270
K838	2092 - 2101	11743	2582	2287	514
K839	2101 - 2110	6286	1868	2076	448
K840	2110 - 2119	4716	1215	1137	235
K841	2119 - 2128	10354	3128	3171	655
K842	2128 - 2137	11713	3477	3211	587
K843	2137 - 2146	7853	2197	1895	334
K844	2146 - 2155	3670	1210	1564	365
K845	2155 - 2164	5389	1805	2139	445
K846	2164 - 2173	16480	5547	5650	1157
K847	2173 - 2182	8707	2957	3324	683
K848	2182 - 2191	50033	13569	12201	2073
K849	2191 - 2200	23490	11388	16639	3331

nC_4	C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
2685	4262	17758	11517	64.85	0.39
5246	7160	27819	20436	73.46	0.41
4214	6044	26171	17992	68.75	0.43
1220	1919	7907	5037	63.70	0.40
2293	3702	13480	8427	62.51	0.39
2142	6437	16321	8555	52.42	0.34
7445	6857	49430	30721	62.15	0.37
5764	6885	47589	28611	60.12	0.41
8393	11962	50662	35569	70.21	0.40
8440	12594	46946	34670	73.85	0.40
2138	3394	13885	8900	64.10	0.40
1553	3017	11039	6214	56.29	0.39
2852	16054	19781	11120	56.22	0.39
725	1211	4599	2777	60.39	0.37
1398	2516	18523	6781	36.61	0.37
1185	1749	11863	5577	47.01	0.38
572	576	7874	3159	40.12	0.41
1472	2032	18780	8425	44.86	0.44
1356	1287	20343	8630	42.42	0.43
699	537	12978	5124	39.49	0.48
857	868	7667	3996	52.13	0.43
1152	1431	10929	5540	50.69	0.39
3018	4668	31852	15372	48.26	0.38
1682	2194	17352	8646	49.82	0.41
5151	7119	83026	32993	39.74	0.40
7744	6383	62593	39102	62.47	0.43

Sample	Depth (m)	C_1	C_2	C_3	iC_4
K850	2200 - 2209	14087	5421	10126	2618
K851	2209 - 2218	15938	7930	13704	3527
K852	2218 - 2227	25418	8111	11023	2624
K853	2227 - 2236	47048	12377	12644	2358
K854	2236 - 2245	24336	8536	12073	2675
K855	2245 - 2254	22237	5675	5540	1100
K856	2254 - 2263	40924	23653	25536	4302
K857	2263 - 2272	57930	45767	52620	9536
K858	2272 - 2281	19831	12050	11040	1807
K859	2281 - 2290	17571	8890	7715	1283
K860	2290 - 2299	10827	4387	3203	465
K861	2299 - 2308	12831	6782	4814	828
K862	2308 - 2317	11665	5698	4097	883
K863	2317 - 2326	9476	4566	4757	1248
K864	2326 - 2335	1920	1229	1409	354
K865	2335 - 2344	865	408	407	99
K868	2344 - 2353	2057	672	388	119
K869	2353 - 2362	4239	1333	854	337
K870	2362 - 2371	1947	934	982	378
K871	2371 - 2380	3319	2261	2326	804
K872	2380 - 2389	42260	18259	15036	3612
K873	2389 - 2398	30600	6864	6883	1466
K874	2398 - 2407	12510	5971	6259	1648
K875	2407 - 2416	10199	6067	6979	1884
K876	2416 - 2425	9771	4924	6379	1851
K877	2425 - 2434	14183	6381	7495	1239

nC_4	C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
6188	7331	38440	24353	63.35	0.42
8527	15295	49625	33687	67.88	0.41
6414	9718	53589	28171	52.57	0.41
5964	10009	80392	33344	41.48	0.40
6809	14678	54429	30093	55.29	0.39
2798	4885	37350	15113	40.46	0.39
10458	17734	104873	63950	60.98	0.41
22586	23489	188438	130508	69.26	0.42
3701	4152	48430	28599	59.05	0.49
3210	5903	38669	21098	54.56	0.40
1185	239	20068	9241	46.05	0.39
1777	328	27032	14201	52.53	0.47
1922	356	24266	12601	51.93	0.46
2860	6367	22907	13431	58.63	0.44
796	1604	5707	3788	66.37	0.44
256	680	2036	1171	57.51	0.39
263	241	3498	1441	41.19	0.45
735	1197	7497	3258	43.46	0.46
1784	1653	5024	3078	61.26	0.48
1760	2694	10471	7152	68.30	0.46
7071	7647	86239	43978	51.00	0.51
2503	2811	48318	17717	36.67	0.59
3058	3982	29446	16936	57.52	0.54
3143	4588	28271	18072	63.93	0.60
3330	4431	26299	16528	62.85	0.57
1762	4563	31060	16877	54.34	0.70

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K878	2434 - 2443	10203	4704	6037	1284	2251
K879	2443 - 2452	16272	8260	11163	2045	3988
K880	2452 - 2461	1313	904	1848	439	1018
K881	2461 - 2470	7793	2824	3973	724	1304
K882	2470 - 2479	25196	10194	12580	1996	3525
K883	2479 - 2488	7756	4453	5605	952	1609
K884	2488 - 2497	10361	5616	6480	1036	1852
K885	2497 - 2506	13019	7245	8476	1344	2252
K886	2506 - 2515	3397	2089	3351	933	1556
K887	2515 - 2524	5665	2967	4872	1498	2351
K888	2524 - 2533	OPEN LID				
K889	2850 - 2860	2047	1278	988	233	368
K890	2533 - 2542	1026	651	1137	291	487
K891	2542 - 2551	121	85	130	40	96
K892	2551 - 2560	264	191	291	77	130
K893	2560 - 2569	246	278	481	118	180
K894	2569 - 2578	339	186	268	78	133
K895	2578 - 2587	1332	184	394	129	298
K896	2587 - 2596	590	279	439	126	262
K897	2596 - 2605	1516	1333	2324	640	1113
K898	2605 - 2614	234	198	237	48	74
K899	2614 - 2623	3900	2068	2423	561	971
K900	2623 - 2632	682	538	714	258	459
K901	2632 - 2641	1198	1060	1001	320	747
K902	2641 - 2650	3940	1949	2358	755	1726
K903	2650 - 2659	2463	1017	1299	454	1060

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
6372	24403	14201	58.19	0.54
10041	41729	25457	61.01	0.51
1456	5522	4209	76.22	0.43
2472	16618	8825	53.11	0.56
4484	53490	28294	52.90	0.57
2156	20374	12618	61.93	0.59
2548	25344	14984	59.12	0.56
3181	32336	19317	59.74	0.60
2194	11327	7930	70.01	0.60
3500	17352	11687	67.35	0.64
1106	4914	2866	58.33	0.63
1217	3593	2566	71.44	0.60
243	471	351	74.36	0.42
518	953	689	72.31	0.59
605	1303	1057	81.10	0.65
520	1005	666	66.25	0.59
755	2337	1005	43.01	0.43
723	1696	1106	65.23	0.48
1882	6927	5411	78.12	0.58
316	791	557	70.41	0.65
2137	9923	6023	60.70	0.58
1677	2650	1968	74.28	0.56
1380	4328	3130	72.32	0.43
3800	10737	6787	63.21	0.44
2021	6293	3830	60.86	0.43

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K904	2659 - 2668	848	321	342	107	179
K905	2668 - 2677	2117	538	824	263	642
K906	2677 - 2686	2547	583	951	328	765
K907	2686 - 2695	2690	650	1001	298	686
K908	2695 - 2704	1378	704	736	218	453
K909	2704 - 2713	2036	1030	1201	346	726
K910	2713 - 2722	748	382	315	78	198
K934	2722 - 2731	385	326	492	125	285
K935	2731 - 2740	29986	6548	1053	126	221
K936	2740 - 2749	12878	979	402	52	101
K937	2749 - 2758	7661	660	257	33	62
K938	2758 - 2767	OPEN LID				
K939	2767 - 2776	2972	462	145	18	36
K940	2776 - 2785	8179	1082	279	36	59
K941	2785 - 2794	OPEN LID				
K942	2794 - 2803	24692	52348	917	109	157
K943	2803 - 2812	OPEN LID				
K944	2812 - 2821	OPEN LID				
K945	2821 - 2830	OPEN LID				
K946	2830 - 2839	1286	346	165	28	53
K947	2839 - 2848	1293	261	231	37	79
K948	2848 - 2857	407	191	157	27	56
K949	2857 - 2866	232	78	59	10	20
K950	2866 - 2875	375	171	141	20	46
K951	2875 - 2884	1061	139	106	14	34
K952	2884 - 2893	2703	665	306	49	102

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
673	1798	950	52.83	0.60
2077	4383	2266	51.71	0.41
2014	5175	2628	50.78	0.43
1243	5325	2635	49.48	0.43
767	3489	2111	60.49	0.48
693	5338	3303	61.87	0.48
859	1721	974	56.56	0.39
634	1613	1229	76.16	0.44
429	37319	7333	19.65	0.57
379	14413	1535	10.64	0.51
141	8623	1012	11.67	0.53
106	3634	661	18.20	0.50
172	9635	1456	15.11	0.62
174	78223	53531	68.43	0.69
123	1879	593	31.56	0.53
187	1901	608	32.00	0.46
76	838	431	51.44	0.48
58	398	166	41.67	0.49
109	752	378	50.25	0.44
93	1355	294	21.67	0.42
198	3824	1121	29.32	0.48

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K953	2893 - 2902	2245	613	253	35	72
K954	2902 - 2911	443	139	93	15	35
K955	2911 - 2920	23831	10868	538	57	108
K956	2920 - 2929	5201	476	211	22	51
K957	2929 - 2938	2113	503	249	34	78
K958	2938 - 2947	21730	839	436	48	100
K959	2947 - 2956	3295	513	170	20	39
K960	2956 - 2965	7248	689	289	34	65
K961	2965 - 2974	6377	633	317	42	84
K962	2974 - 2983	716	204	110	17	37
K963	2983 - 2992	1216	156	142	22	50
K964	2992 - 3001	6924	442	175	20	44
K965	3001 - 3010	1465	161	85	11	25
K966	3010 - 3019	1633	314	162	27	60
K967	3019 - 3028	104	57	77	14	31
K968	3028 - 3037	528	71	71	14	36
K969	3037 - 3046	311	83	80	17	40
K970	3046 - 3055	39241	1121	323	30	65
K971	3055 - 3064	2049	110	56	8	18
K972	3064 - 3073	1322	213	129	25	58
K973	3073 - 3082	32932	1098	345	44	97
K974	3082 - 3091	8605	672	344	62	137
K975	3091 - 3100	2825	246	98	16	32
K976	3100 - 3109	715	187	111	24	51
K977	3109 - 3118	2948	99	64	17	33
K978	3118 - 3127	11693	527	238	49	94

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
152	3218	972	30.22	0.48
83	725	282	38.94	0.44
141	35401	11570	32.68	0.52
103	5962	761	12.76	0.44
128	2978	865	29.04	0.44
123	23153	1423	6.15	0.48
38	4036	741	18.36	0.51
86	8325	1077	12.94	0.51
128	7452	1075	14.43	0.50
119	1085	367	33.98	0.44
105	1585	370	23.32	0.43
120	7605	681	8.95	0.45
61	1747	282	16.15	0.43
118	2196	563	25.63	0.45
65	283	179	63.19	0.46
86	718	190	26.46	0.42
96	531	219	41.34	0.42
127	40779	1538	3.77	0.47
33	2241	192	8.57	0.44
122	1747	425	24.32	0.44
290	34516	1584	4.59	0.46
277	9821	1216	12.38	0.45
134	3217	392	12.17	0.49
135	1088	373	34.25	0.47
86	3162	213	6.75	0.53
204	12603	910	7.22	0.52

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K979	3127 - 3136	5063	239	137	34	61
K980	3136 - 3145	2352	128	78	18	32
K981	3145 - 3154	3556	225	146	36	67
K982	3154 - 3163	793	215	169	45	87
K983	3163 - 3172	208	60	54	19	31
K984	3172 - 3181	243	148	196	70	135

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
189	5536	472	8.54	0.55
78	2609	256	9.82	0.57
432	4029	473	11.74	0.53
255	1309	516	39.41	0.52
91	372	166	44.06	0.62
579	790	548	69.30	0.52

TABLE 1b

Concentration μl gas/kg rock of C_1-C_7 hydrocarbons

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5^+
K694	1490 - 1520	52	61	87	24	67	707
K695	1520 - 1550	45	18	12	1	8	54
K696	1550 - 1580	14	5	6	5	10	103
K697	1580 - 1610	25	1	73	65	179	1191
K698	1610 - 1640	4	2	2	2	6	29
K699	1640 - 1670	19	10	8	12	38	206
K700	1670 - 1700	3	1	47	40	114	892
K804	1724 - 1730	40	30	15	25	64	3431
K805	1730 - 1750	3	1	1	2	10	349
K806	1750 - 1780	NOT ENOUGH MATERIAL					
K807	1790 - 1820	107	19	37	53	147	117
K808	1810 - 1840	1129	209	620	662	1912	25829
K809	1840 - 1849	63	41	313	246	780	3895
K810	1849 - 1858	108	114	1007	672	1899	9051
K811	1858 - 1867	164	49	47	96	319	1617
K812	1867 - 1876	62	61	580	377	1120	7318
K813	1876 - 1885	210	91	689	540	1528	9533
K814	1885 - 1894	330	113	613	831	2476	31965
K815	1894 - 1903	34	7	55	86	258	3787
K816	1903 - 1912	61	6	50	69	164	110
K817	1912 - 1921	109	22	9	17	56	3291
K818	1921 - 1930	57	17	10	15	62	912
K820	1930 - 1939	64	12	5	5	15	495
K821	1939 - 1948	13	3	2	6	20	1236

in cuttings.

C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
291	239	82.10	0.35
84	39	46.49	0.14
40	26	65.90	0.53
344	319	92.67	0.36
18	12	74.02	0.38
77	58	75.72	0.32
206	202	98.12	0.35
174	135	77.27	0.40
17	15	85.48	0.26
363	256	70.44	0.36
4532	3403	75.08	0.35
1442	1380	95.67	0.32
3800	3692	97.16	0.35
675	511	75.71	0.30
2200	2138	97.19	0.34
3057	2848	93.14	0.35
4363	4033	92.44	0.34
439	405	92.20	0.33
351	290	82.67	0.42
212	104	49.18	0.31
161	105	64.93	0.25
100	37	36.59	0.33
44	31	71.39	0.31

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5^+
K822	1948 - 1957	13	2	7	10	45	860
K823	1957 - 1966	264	157	1821	1693	5068	20518
K824	1966 - 1975	118	309	3521	2454	6925	14327
K825	1975 - 1984	448	135	1231	1414	4743	41481
K826	1984 - 1993	68	55	814	711	1981	4597
K827	1993 - 2002	128	43	331	606	1759	20050
K828	2002 - 2011	272	50	42	85	403	3600
K829	2011 - 2020	125	25	25	38	216	1471
K830	2020 - 2029	149	160	98	12	42	3903
K831	2029 - 2038	95	36	137	112	401	6589
K832	2038 - 2047	130	52	436	381	1390	17056
K833	2047 - 2056	186	297	176	340	1370	21248
K834	2056 - 2065	210	72	119	88	334	9423
K835	2065 - 2074	160	37	45	27	107	9355
K836	2074 - 2083	118	106	43	28	94	7943
K837	2083 - 2092	NOT ENOUGH MATERIAL					
K838	2092 - 2101	NOT ENOUGH MATERIAL					
K839	2101 - 2110	121	31	61	58	310	2987
K840	2110 - 2119	109	23	9	7	36	602
K841	2119 - 2128	427	54	99	75	352	13190
K842	2128 - 2137	100	25	22	10	60	3230
K843	2137 - 2146	217	66	44	18	75	4058
K844	2146 - 2155	162	52	44	18	69	2657
K845	2155 - 2164	620	72	73	30	118	8593
K846	2164 - 2173	75	24	29	19	70	2214

C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
77	64	83.08	0.22
9003	8739	97.07	0.33
13326	13209	99.12	0.35
7971	7523	94.38	0.30
3630	3562	98.12	0.36
2866	2738	95.54	0.34
851	579	68.01	0.21
429	304	70.89	0.18
463	315	67.87	0.28
780	685	87.84	0.28
2390	2260	94.57	0.27
2369	2184	92.16	0.25
821	612	74.48	0.26
376	217	57.56	0.25
388	270	69.69	0.29
582	461	79.24	0.19
184	76	41.14	0.20
1007	580	57.61	0.21
217	117	53.82	0.17
421	204	48.53	0.24
345	183	53.11	0.25
913	293	32.11	0.25
217	142	65.45	0.27

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5^+
K847	2173 - 2182	157	81	145	41	181	3245
K848	2182 - 2191	372	42	63	38	155	3133
K849	2191 - 2200	65	27	92	45	188	5093
K850	2200 - 2209	249	175	1988	1897	5230	20528
K851	2209 - 2218	60	4	4	5	14	400
K852	2218 - 2227	92	19	298	897	2343	9376
K853	2227 - 2236	179	41	19	44	181	4530
K854	2236 - 2245	111	27	58	288	920	14657
K855	2245 - 2254	77	103	824	630	1448	13161
K856	2254 - 2263	193	59	22	27	119	2624
K857	2263 - 2272	235	80	386	226	812	15603
K858	2272 - 2281	283	254	1460	521	1861	19094
K859	2281 - 2290	200	1230	3238	617	1853	9773
K860	2290 - 2299	202	48	82	73	347	2708
K861	2299 - 2308	13	97	165	37	97	168
K862	2308 - 2317	350	5289	7666	903	2699	8073
K863	2317 - 2326	173	1394	3093	436	1425	5266
K864	2326 - 2335	256	801	2031	336	1205	5270
K865	2335 - 2344	312	408	853	168	508	4505
K868	2344 - 2353	26	124	196	45	153	525
K869	2353 - 2362	17	48	107	30	108	606
K870	2362 - 2371	72	22	72	36	156	1007
K871	2371 - 2380	5	7	45	29	108	499
K872	2380 - 2389	40	15	124	45	165	418
K873	2389 - 2398	44	18	82	35	139	715

C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4	
605	448	74.00	0.23	
671	298	44.48	0.24	
416	352	84.48	0.24	
9538	9289	97.39	0.36	
87	26	30.39	0.36	NB
3650	3558	97.47	0.38	
466	287	61.51	0.24	
1405	1294	92.09	0.31	
3081	3004	97.50	0.43	
420	228	54.16	0.23	
1740	1505	86.48	0.28	
4380	4097	93.54	0.28	
7136	6937	97.20	0.33	
752	551	73.21	0.21	
409	396	96.78	0.38	
16907	16557	97.93	0.33	
6522	6348	97.34	0.31	
4629	4373	94.48	0.28	
2250	1937	86.11	0.33	
544	518	95.22	0.30	
311	294	94.60	0.28	
359	287	79.85	0.23	
195	190	97.19	0.27	
388	348	89.73	0.27	
319	275	86.09	0.25	

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K874	2398 - 2407	178	117	728	288	1204
K875	2407 - 2416	10	3	23	10	36
K876	2416 - 2425	153	90	532	227	819
K877	2425 - 2434	191	109	491	209	812
K878	2434 - 2443	967	298	1443	635	2735
K879	2443 - 2452	2197	798	350	157	603
K880	2452 - 2461	220	58	365	270	1205
K881	2461 - 2470	43	21	42	22	75
K882	2470 - 2479	645	281	3794	1875	8021
K883	2479 - 2488	1242	1793	13331	4319	15508
K884	2488 - 2497	834	2636	17070	5096	16574
K885	2497 - 2506	704	1854	18513	5263	17783
K886	2506 - 2515	5	5	236	114	382
K887	2515 - 2524	5	2	230	121	320
K888	2524 - 2533	326	106	2047	950	3275
K889	2850 - 2860	99	101	435	142	529
K890	2533 - 2542	53	19	259	149	583
K891	2542 - 2551	91	62	808	363	1273
K892	2551 - 2560	209	97	1512	710	3051
K893	2560 - 2569	38	14	259	124	455
K894	2569 - 2578	16	7	95	48	175
K895	2578 - 2587	336	277	2849	1324	5417
K896	2587 - 2596	8	5	57	34	117
K897	2596 - 2605	6	5	50	26	79
K898	2605 - 2614	23	11	256	144	471

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
6641	2516	2337	92.91	0.24
87	83	73	87.76	0.28
2590	1820	1667	91.58	0.28
3294	1812	1621	89.43	0.26
30536	6078	5111	84.08	0.23
19053	4105	1908	46.49	0.26
7714	2118	1898	89.60	0.22
312	202	159	78.58	0.29
14598	14616	13971	95.59	0.23
16991	36193	34952	96.57	0.28
14151	42209	41375	98.02	0.31
2415	44117	43413	98.48	0.30
522	7419	7369	99.32	0.30
555	678	673	99.30	0.38
4046	6704	6378	95.14	0.29
2062	1307	1207	92.39	0.27
1021	1063	1010	94.99	0.26
2432	2598	2507	96.49	0.29
6800	5579	5370	96.26	0.23
716	8890	8513	95.76	0.27
365	340	324	95.26	0.27
11623	10204	9867	96.70	0.24
222	222	214	96.22	0.29
272	166	159	96.10	0.33
750	906	882	97.35	0.30

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4
K899	2614 - 2623	178	88	1058	462	1627
K900	2623 - 2632	663	6	974	826	3291
K901	2632 - 2641	158	229	1961	915	2987
K902	2641 - 2650	30	19	233	91	294
K903	2650 - 2659	15	12	178	81	256
K904	2659 - 2668	19	16	283	134	416
K905	2668 - 2677	13	19	102	38	115
K906	2677 - 2686	229	60	131	249	578
K907	2686 - 2695	199	119	1738	691	2548
K908	2695 - 2704	1236	721	6274	2321	9139
K909	2704 - 2713	699	208	3229	1425	5723
K910	2713 - 2722	3640	1312	8862	3217	12230
K934	2722 - 2731	1145	665	3780	1145	4390
K935	2731 - 2740	231782	43462	23493	2887	8800
K936	2740 - 2749	18918	22411	15136	1579	5549
K937	2749 - 2758	27424	24001	18448	2143	6078
K938	2758 - 2767	38292	35111	25202	2860	9091
K939	2767 - 2776	2324	11621	12165	1517	5528
K940	2776 - 2785	22666	35750	26884	3334	8739
K941	2785 - 2794	56446	35134	11880	1168	2605
K942	2794 - 2803	57809	39144	13447	1393	2890
K943	2803 - 2812	16068	20884	10141	1150	2876
K944	2812 - 2821	1601	7342	5682	672	2328
K945	2821 - 2830	6238	10859	5516	631	1378
K946	2830 - 2839	437	821	1238	267	879

C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
2070	3413	3235	94.79	0.28
9752	5761	5098	88.49	0.25
4832	6249	6091	97.48	0.31
145	667	637	95.47	0.31
435	543	528	97.32	0.32
686	868	848	97.76	0.32
97	288	275	95.38	0.33
5978	1246	1017	81.65	0.43
3558	5295	5096	96.25	0.27
15687	19691	18455	93.72	0.25
10064	11284	10585	93.80	0.25
22636	29261	25621	87.56	0.26
5269	11124	9980	89.71	0.26
7388	310425	78643	25.33	0.33
5400	63593	44675	70.25	0.28
4316	78095	50672	64.88	0.35
7161	110557	72265	65.36	0.31
5446	33155	30811	92.99	0.27
6777	97373	74706	76.72	0.38
1561	107233	50787	47.36	0.45
1623	114683	56875	49.59	0.48
2030	51119	35051	68.57	0.40
1884	17626	16025	90.92	0.29
719	24622	18383	74.66	0.46
958	3643	3206	88.00	0.30

Sample	Depth (m)	C_1	C_2	C_3	iC_4
K947	2839 - 2848	108	226	364	92
K948	2848 - 2857	122	170	249	53
K949	2857 - 2866	49	26	106	40
K950	2866 - 2875	54	37	56	20
K951	2875 - 2884	62	82	124	34
K952	2884 - 2893	300	384	720	145
K953	2893 - 2902	159	369	808	135
K954	2902 - 2911	55	156	116	38
K955	2911 - 2920	154	164	98	13
K956	2920 - 2929	2214	956	697	123
K957	2929 - 2938	256	269	328	75
K958	2938 - 2947	1261	948	650	82
K959	2947 - 2956	1585	1594	1231	147
K960	2956 - 2965	1676	1069	1068	150
K961	2965 - 2974	NOT ENOUGH MATERIAL			
K962	2974 - 2983	131	183	181	37
K963	2983 - 2992	59	47	97	30
K964	2992 - 3001	247	90	39	6
K965	3001 - 3010	410	211	215	60
K966	3010 - 3019	54	47	133	47
K967	3019 - 3028	78	35	61	18
K968	3028 - 3037	36	15	41	14
K969	3037 - 3046	56	39	77	25
K970	3046 - 3055	690	693	332	33
K971	3055 - 3064	72	82	65	10

nC_4	C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
358	606	1148	1040	90.61	0.26
223	413	817	695	85.07	0.24
172	432	393	344	87.47	0.24
95	242	262	207	79.20	0.21
145	239	447	385	86.08	0.23
483	558	2032	1732	85.25	0.30
463	402	1933	1775	91.79	0.29
172	298	538	483	89.72	0.22
50	62	480	326	67.97	0.27
530	1104	4521	2306	51.02	0.23
323	700	1253	995	79.45	0.23
335	376	3281	2096	61.56	0.26
611	840	5167	3583	69.33	0.24
575	620	4538	2863	63.08	0.26
163	327	695	564	81.11	0.23
141	254	375	315	84.18	0.22
25	45	407	160	39.37	0.25
246	517	1142	732	64.11	0.24
212	504	494	439	88.97	0.22
79	243	271	193	71.27	0.22
62	169	176	139	79.35	0.21
105	267	302	246	81.51	0.24
115	81	1863	1172	62.94	0.29
40	89	269	196	73.06	0.24

Sample	Depth (m)	C_1	C_2	C_3	iC_4
K972	3064 - 3073	83	87	108	24
K973	3073 - 3082	932	1960	822	83
K974	3082 - 3091	109	210	205	40
K975	3091 - 3100	96	128	86	20
K976	3100 - 3109	75	22	85	37
K977	3109 - 3118	217	246	205	45
K978	3118 - 3127	284	528	323	67
K979	3127 - 3136	112	430	343	71
K980	3136 - 3145	910	795	350	62
K981	3145 - 3154	186	258	150	39
K982	3154 - 3163	113	54	131	59
K983	3163 - 3172	102	101	210	77
K984	3172 - 3180	93	23	194	74

nC_4	C_5^+	C_1-C_4	C_2-C_4	% wetness	iC_4/nC_4
106	266	407	324	79.71	0.23
277	239	4075	3143	77.13	0.30
165	335	730	620	85.06	0.24
81	173	410	314	76.66	0.25
159	398	378	303	80.20	0.24
193	360	906	688	76.03	0.23
248	341	1450	1165	80.38	0.27
253	332	1223	1111	90.82	0.28
239	414	2355	1446	61.41	0.26
153	280	785	599	76.34	0.25
242	545	600	486	81.12	0.24
289	561	779	677	86.90	0.27
291	568	675	582	86.26	0.25

TABLE 1c

Concentration μl gas/kg rock of C_1-C_7 hydrocarbons ($I_A + I_B$)

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K694	1490-1520	2859	82	117	31	77	806	3166	307	9.70	0.40
K695	1520- 50	1203	37	49	11	20	119	1319	116	8.79	0.55
K696	1550- 80	1183	54	75	21	27	158	1360	178	13.08	0.78
K697	1580-1610	578	27	125	77	194	1234	1002	424	43.32	0.40
K698	1610- 40	544	21	31	20	30	74	649	103	15.87	0.67
K699	1640- 70	417	22	27	34	64	236	533	137	24.77	0.53
K700	1670-1700	285	2	52	56	138	934	533	249	46.71	0.41
K804	1724- 30	Open lid									
K805	1730- 50	685	107	101	98	223	751	1213	529	43.61	0.44
K806	1750- 80	Not enough material									
K807	1790-1820	282149	43420	43286	11407	29044	2335	409308	127159	31.07	0.39
K808	1810- 40	91841	2618	3342	1078	3214	25997	30092	10251	34.07	0.34
K809	1840- 49	38281	8784	11268	1499	6174	7539	66006	27725	42.00	0.24
K810	1849- 58	30113	12117	15287	4010	8952	13670	70480	40366	57.27	0.45
K811	1858- 67	44363	18085	24196	5799	13666	13703	106108	61746	58.19	0.42
K812	1867- 76	75146	22646	23967	5674	12322	16206	139750	64604	46.22	0.46
K813	1876- 85	23137	9223	13567	3325	8586	10152	57836	34701	60.00	0.36
K814	1883- 94	30065	9240	14178	4395	10970	35435	68848	38783	56.33	0.40
K815	1894-1903	15698	4940	7631	1764	4784	7328	34816	19118	54.91	0.36
K816	1913- 12	11588	2418	3901	700	2382	539	20990	9401	44.79	0.29
K817	1912- 21	10292	2262	3396	526	1932	4895	18407	8116	44.09	0.27
K818	1921- 30	3553	1550	3693	902	2903	2264	12601	9049	71.81	0.31
K820	1930- 39	1181	434	566	119	285	547	2584	1404	53.33	0.42
K821	1939- 48	8917	3271	4104	799	2008	4718	19096	10179	53.30	0.40
K822	1948- 57	3405	1689	1740	318	748	1553	7901	4496	56.90	0.42

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K823	1957- 66	5433	4656	8993	3347	9144	34978	31573	26140	82.79	0.36
K824	1966- 75	6359	3499	8104	3512	9610	18589	31084	24726	79.54	0.36
K825	1975- 84	7831	4726	9655	3588	9989	48641	35790	27959	78.11	0.35
K826	1984- 93	8247	4617	8219	2522	6195	10641	29801	21554	72.32	0.41
K827	1993-2002	2998	1386	2313	1079	2979	21969	10773	7775	72.17	0.37
K828	2002- 11	5325	1984	3340	987	2696	7302	14331	9003	62.82	0.37
K829	2011- 20	7891	2482	3242	776	2356	7908	16750	8859	52.88	0.32
K830	2020- 29	18858	8558	12055	2834	7487	10760	49893	31036	62.21	0.38
K831	2029- 38	19073	9298	11371	2463	6165	13474	48369	29296	60.65	0.40
K832	2038- 47	15223	9448	14898	3699	9783	29018	53052	37829	71.30	0.37
K833	2047- 56	12462	8853	14495	3695	9810	33842	49315	36854	74.73	0.38
K834	2056- 65	5195	2364	3743	935	2472	12817	14706	9512	64.68	0.38
K835	2065- 74	4985	1645	2486	639	1660	12372	11415	6431	56.34	0.38
K836	2074- 83	8779	2993	4317	1134	2946	23997	20169	11390	56.47	0.38
K837	2083- 92	Not enough material									
K838	2092-2101	Not enough material									
K839	2101- 10	6395	1891	2085	455	1221	2351	12047	5653	46.92	0.37
K840	2010- 19	4825	1238	1142	242	608	1178	8058	3235	40.15	0.40
K841	2119- 28	10781	3182	3270	730	1824	15222	19787	9005	45.50	0.40
K842	2128- 37	11813	3502	3233	597	1416	4517	20560	8747	42.54	0.42
K843	2137- 46	8070	2263	1939	352	774	4595	13399	5328	39.76	0.45
K844	2146- 55	3832	1262	1608	383	926	3525	8012	4179	52.16	0.41
K845	2155- 64	6009	1977	2212	475	1270	10024	11842	5833	49.25	0.37
K846	2164- 73	16555	5571	5679	1176	3088	6882	32069	15514	48.38	0.38
K847	2173- 82	8864	3038	3469	828	1863	5439	17957	9094	50.64	0.44

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K848	2182- 91	50405	13611	12264	2111	5306	10252	83697	33291	39.78	0.40
K849	2191-2200	23555	11415	16731	3376	7932	11476	63009	39454	62.62	0.43
K850	2200- 09	14336	5596	12114	4515	11418	27859	47978	33642	70.11	0.40
K851	2209- 18	15998	7934	13708	3532	8541	15695	49712	33713	69.82	0.41
K852	2218- 27	25510	8130	11321	3521	8757	19094	57239	31729	55.43	0.38
K853	2227- 36	47227	12418	12663	2402	6145	14539	84042	33631	40.02	0.39
K854	2236- 45	24447	8563	12131	2963	7729	29335	55834	31387	56.21	0.38
K855	2245- 54	22314	5778	6364	1730	4246	18046	40431	18117	44.81	0.41
K856	2254- 63	41117	23712	25558	4335	10577	20358	105293	64178	60.95	0.41
K857	2263- 72	58165	45847	53006	9762	23398	39092	190178	132013	69.42	0.42
K858	2272- 81	20114	12304	12500	2328	5562	23246	52810	32696	61.91	0.42
K859	2281- 90	17771	10120	10953	1900	5063	15676	45805	28035	61.21	0.42
K860	2290- 99	11029	4435	3285	538	1532	2947	20820	9792	47.03	0.35
K861	2299-2308	12844	6879	4979	865	1874	496	27441	14597	53.19	0.46
K862	2308- 17	12015	10987	11763	1786	4621	8429	41173	29158	70.82	0.39
K863	2317- 26	9649	5960	7850	1684	4285	11633	29429	19779	67.21	0.39
K864	2326- 35	2176	2030	3440	690	2001	6874	10336	8161	78.96	0.35
K865	2335- 44	1177	816	1668	267	764	5185	4286	3108	72.52	0.35
K868	2344- 53	2083	796	584	164	416	766	4042	1959	48.47	0.39
K869	2353- 62	4256	1381	961	367	843	1803	7808	3552	45.49	0.44
K870	2362- 71	2019	956	1054	414	940	2660	5383	3365	62.51	0.44
K871	2371- 80	3324	2268	2371	833	1868	3193	86434	44168	51.10	0.45
K872	2380- 89	42300	18274	15160	3657	7236	8065	86627	44326	51.17	0.51
K873	2389- 98	30644	6882	6965	1501	2642	3526	48637	17992	37.00	0.57
K874	2398-2407	12688	6088	6987	1936	4262	10623	31962	19273	60.30	0.45

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K875	2407- 16	10209	6070	7002	1894	3176	4675	28354	18145	64.00	0.60
K876	2416- 25	9924	5014	6911	2078	4149	7021	28119	18195	64.71	0.50
K877	2425- 34	14374	6490	7986	1448	2574	7857	32872	18498	59.56	0.26
K878	2434- 43	11170	5002	7480	1919	4868	36908	30481	19312	63.36	0.38
K879	2443- 52	18469	9058	11513	2202	4591	29094	45834	27365	59.70	0.48
K880	2452- 61	1533	962	2213	709	2223	9170	7640	6107	79.93	0.32
K881	2461- 70	7836	4845	4015	746	1379	2784	16820	8984	53.41	0.54
K882	2470- 79	25841	10475	16374	3871	11546	19082	68106	42265	62.06	0.34
K883	2479- 88	8998	6246	18936	5271	17117	19147	56567	47570	84.10	0.31
K884	2488- 97	11195	8252	23550	6132	18426	16699	67553	56359	83.43	0.33
K885	2497- 506	13723	9099	26989	6607	20035	5596	76453	62730	82.05	0.33
K886	2506- 15	3402	2094	3587	1047	1938	2716	18746	15299	81.61	0.54
K887	2515- 24	5670	2969	5102	1619	2671	4055	18030	12360	68.55	0.61
K888	2524- 33	Open lid									
K890	2533- 42	1079	670	1396	440	1653	2237	4656	3576	76.80	0.27
K891	2542- 51	212	147	938	403	1369	2675	3069	2858	93.13	0.29
K892	2551- 60	473	288	1803	787	3181	7318	6532	6059	92.76	0.25
K893	2560- 69	284	292	739	242	635	1321	10193	9570	93.89	0.38
K894	2569- 78	355	193	363	126	308	885	1345	990	73.61	0.41
K895	2578- 87	1668	461	3243	1453	5715	12378	12541	10872	86.69	0.25
K896	2587- 96	598	284	496	160	379	945	1918	1320	68.82	0.42
K897	2596-2605	1522	1338	2374	666	1192	2154	7093	5570	78.53	0.56
K898	2605- 14	257	209	493	192	545	1066	2603	1439	55.28	0.35
K899	2614- 23	4078	2156	3481	1023	2598	4207	13336	9258	69.42	0.39
K900	2623- 32	1345	544	1688	1084	3750	11429	8411	7066	84.01	0.29

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K-901	2632-41	1356	1289	2962	1235	3734	6212	10577	9221	87.18	0.33
K-902	2641-50	3970	1968	2591	846	2020	3945	11404	7424	65.10	0.42
K-903	2650-59	2478	1029	1477	535	1316	2456	6836	4358	63.75	0.41
K-904	2659-68	867	337	625	241	595	1359	2666	1798	67.44	0.41
K-905	2668-77	2130	557	926	301	757	2174	4671	2541	54.40	0.40
K-906	2677-86	2776	643	1082	577	1343	7992	6421	3645	56.77	0.43
K-907	2686-95	2889	769	2739	989	3234	4801	10620	7731	72.80	0.31
K-908	2695-704	2614	1425	7010	2539	9592	16454	23180	20566	88.72	0.27
K-909	2704-2713	2735	1238	4430	1771	6449	10757	16622	13888	83.55	0.28
K-910	2713-22	4388	1694	9177	3295	12428	23495	30982	26595	85.84	0.27
K-934	2722-31	1530	991	4272	1270	4675	5903	12737	11209	88.00	0.27
K-935	2731-40	261768	50010	24546	3013	9021	7817	347744	85976	24.72	0.33
K-936	2740-49	31796	23390	15538	1631	5650	5779	78006	46210	59.24	0.29
K-937	2749-58	35085	24661	18705	2176	6140	4457	86718	51684	59.60	0.35
K-938	2758-67	Open lid									
K-939	2767-76	5296	12083	12310	1535	5564	5552	36789	31472	85.55	0.28
K-940	2776-85	30845	36832	27163	3370	8798	6949	107008	76162	71.17	0.38
K-941	2785-94	Open lid									
K-942	2794-2803	82501	91492	14364	1502	3047	1797	192906	110406	57.23	0.49
K-943	2803-12	Open lid									
K-944	2812-21	Open lid									
K-945	2821-30	Open lid									
K-946	2830-39	1723	1167	1403	295	932	1081	5522	3799	68.80	0.32
K-947	2839-48	1401	487	595	129	437	793	2949	1648	55.80	0.30

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K-948	2848- 57	529	361	406	80	279	489	1655	1126	68.04	0.29
K-949	2857- 66	281	104	165	50	192	490	791	510	64.48	0.26
K-950	2866- 75	429	208	197	40	141	351	1014	585	57.69	0.28
K-951	2875- 84	1123	221	230	48	179	332	1802	679	37.68	0.27
K-952	2884- 93	3003	1049	1026	194	585	756	5856	2853	48.72	0.33
K-953	2893-2902	2404	982	1061	170	535	554	5151	2747	53.33	0.32
K-954	2902- 11	498	295	209	53	207	381	1263	765	60.57	0.26
K-955	2911- 20	2537	11032	636	70	158	203	35881	11896	33.15	0.44
K-956	2920- 29	7415	1432	908	145	581	1207	10483	3067	29.26	0.25
K-957	2929- 38	2369	772	577	109	401	828	4231	1860	43.96	0.27
K-958	2938- 47	22991	1787	1086	130	435	499	26434	3519	13.31	0.30
K-959	2947- 56	4880	2107	1401	167	650	878	9203	4324	46.99	0.26
K-960	2956- 65	8924	1758	1347	184	640	706	12863	3940	30.63	0.29
K-961	2965- 74	not enough material									
K-962	2974- 83	847	387	291	54	200	446	1780	931	52.30	0.27
K-963	2983- 92	1275	203	239	52	213	359	1960	685	34.95	0.24
K-964	2992-3001	7171	532	214	26	69	165	8012	841	10.50	0.38
K-965	3001- 10	1875	372	300	71	271	578	2889	1014	35.10	0.26
K-966	3010- 19	1687	361	295	74	272	622	2690	1002	37.25	0.27
K-967	3019- 28	182	92	138	32	110	308	554	372	67.15	0.29
K-968	3028- 37	564	86	112	28	98	255	894	329	36.80	0.29
K-969	3037- 46	367	122	157	42	145	363	833	465	55.82	0.29
K-970	3046- 55	39931	1814	655	63	180	208	42642	2710	6.36	0.35

Sample	Depth (m)	C_1	C_2	C_3	iC_4	nC_4	C_5+	ΣC_1-C_4	ΣC_2-C_4	% wetness	iC_4/nC_4
K-971	3044- 64	2121	192	121	18	58	122	2510	388	15.46	0.31
K-972	3064- 73	1405	300	237	49	164	388	2154	749	34.77	0.30
K-973	3073- 82	33864	3058	1167	127	374	529	38591	4727	12.25	0.34
K-974	3082- 91	8714	882	549	102	302	612	10551	1836	17.40	0.34
K-975	3091-3100	2921	374	184	36	113	307	3627	706	19.47	0.32
K-976	3100- 09	790	209	196	61	210	533	1466	676	46.11	0.29
K-977	3109- 18	3165	345	269	62	226	446	4068	901	22.15	0.27
K-978	3118- 27	11977	1055	561	116	342	749	14053	2075	14.77	0.34
K-979	3127- 36	5175	669	480	105	314	521	6759	1583	23.42	0.33
K-980	3136- 45	3262	923	428	80	271	492	4964	1702	34.29	0.30
K-981	3145- 54	3742	483	296	75	220	712	4814	1072	22.27	0.34
K-982	3154- 63	906	269	300	104	329	800	1909	1002	52.49	0.32
K-983	3163- 72	310	161	264	96	320	652	1151	843	73.24	0.30
K-984	3172- 80	336	171	390	144	426	1147	1465	1130	77.13	0.34

TABLE II

Lithology and Total Organic Carbon (TOC) measurements.

Depth (m)	TOC		Lithology
1490 - 1520	1.48	100%	Claystone, grey to dark grey, slightly brownish, green observed.
		sm.am.	Quartz Sand.
		obs.	Pyrite.
1520 - 1550	1.71	100%	Claystone, browngrey, partly with mica.
		sm.am.	Quartz Sand.
1550 - 1580	1.65	100%	Claystone, grey and browngrey, green observed.
1580 - 1610	1.58	100%	Claystone, grey, dark grey, slightly brownish in part.
		obs.	Siltstone, brownish light grey.
1610 - 1640	1.52	100%	Claystone, grey, brownish, greenish, green.
1640 - 1670	0.92	100%	Claystone, green, brownish grey.
1670 - 1700	1.07	100%	Claystone, light green to green, brown and browngrey.
1724 - 1730	0.84	100%	Claystone, light green to greengrey, some grey to brown.
		sm.am.	Cement.
			Considerable amounts mud additives (organic).
1730 - 1750	0.62	100%	Claystone, grey to green.
		sm.am.	Cement.
1750 - 1780	0.63	100%	Claystone, light grey to green.

Depth (m)	TOC		Lithology
1790 - 1820	0.60	100%	Claystone, light grey and grey to light green.
1810 - 1840	0.84	100%	Claystone, as above.
1840 - 1849	1.33	100%	Claystone, as above.
1849 - 1858	1.66	100%	Claystone, greenish and brownish grey, some micaceous light brown silty Claystone.
		sm.am.	Silt/Claystone, light brown.
1858 - 1867	1.70	100%	Claystone, brownish light grey/grey and light green.
1867 - 1876	1.69	100%	Claystone, as above.
		sm.am.	Clay/Siltstone, light brown.
1876 - 1885		100%	Claystone, as above, brownish light/grey (partly micaceous and silty) and light green, green observed.
1885 - 1894	1.00	100%	Claystone, light greengrey to light green, brownish grey, green observed.
		sm.am.	Marl, light brown.
1894 - 1903	1.07	100%	Claystone, light green, grey to browngrey.
		sm.am.	Silt/Claystone, light brown.
1903 - 1912	0.78	100%	Claystone, greygreen to green, grey to brown.
		sm.am.	Silt/Claystone.
1912 - 1921	0.70	100%	Claystone, as above.
		sm.am.	Silt/Claystone, light brown.

Depth (m)	TOC		Lithology
1921 - 1930	0.61	100%	Claystone, as above.
		sm.am.	Calcareous Siltstone, white.
1930 - 1939		85%	Claystone, greenish grey.
		15%	Cement.
		sm.am.	Claystone, silty, brownish light grey; Siltstone, clayey, light brown, white, brown, partly calcareous; Limestone.
1939 - 1948	0.27	85%	Claystone, greengrey, green, some grey, violet.
		15%	Cement.
1948 - 1957	0.77	100%	Claystone, greengrey/light green to grey and light grey, some slightly brownish grey and violet.
		sm.am.	Quartz Sand; clayey Siltstone, light grey, brown.
1957 - 1966	1.57	100%	Claystone, light grey to grey, greengrey to green, some dark grey.
		sm.am.	Siltstone, clayey, brownish light grey.
1966 - 1975	1.57	100%	Claystone, as above.
		sm.am.	Clay/Siltstone, brownish light grey; Dolomite.
1975 - 1984	1.50	100%	Claystone, light grey and grey, some light green and dark grey.
		sm.am.	Clay/Siltstone, light brown.
1984 - 1993	1.31	100%	Claystone, light grey, grey, greengrey, green, mottled texture of light grey and green material (silty) observed.

Depth (m)	TOC		Lithology
1993 - 2002	1.14	100%	Claystone, light grey (partly silty), grey, slightly brownish, some dark grey, mottled texture observed.
		sm.am.	Quartz Sand, clear.
2002 - 2011	0.94	100%	Claystone, light grey, grey, some greenish/green, dark grey.
2011 - 2020	1.14	100%	Claystone, light grey, grey.
		sm.am.	Quartz Sand, clear; Marl, light grey/white.
2020 - 2029	1.41	100%	Claystone, grey, light grey (partly grading to Marl), some green and dark grey, mottled green fragments observed.
		sm.am.	Siltstone, brownish light grey, calcareous.
2029 - 2038	1.19	100%	Claystone, grey, light grey, some dark grey and greenish.
		sm.am.	Clay/Siltstone, light brown; Limestone, light grey, light brown, brown.
2038 - 2047	1.40	100%	Claystone, as above.
		sm.am.	Clay/Siltstone, as above; Limestone, as above.
2047 - 2056	1.47	100%	Claystone, as above.
		sm.am.	Quartz.
2056 - 2065	1.22	100%	Claystone, grey, light grey, greengrey, green.
		sm.am.	Quartz; Limestone.
2065 - 2074	0.74	100%	Claystone, light grey to grey, some green/greenish, dark grey.

Depth (m)	TOC		Lithology
2074 - 2083	0.54	100%	Claystone, greenish, light grey to grey, light green to green.
2083 - 2092	0.55	100%	Claystone, grey to green and light grey.
2092 - 2101	0.59	100%	Claystone, as above.
		sm.am.	Quartz Sand; Siltstone, light brown Pyrite; Marl, light grey/white.
2101 - 2110	0.70	100%	Claystone, grey, greengrey, dark grey, light grey.
		sm.am.	Quartz Sand; Siltstone, light grey with Glauconite; Limestone, brown; Pyrite.
2110 - 2119	0.73	100%	Claystone, light grey to grey partly greenish.
2119 - 2128	0.89	100%	Claystone, grey, some light grey, greenish.
		sm.am.	Siltstone, clayey, light brown; Limestone, brown; Quartz Sand.
2128 - 2137	0.83	100%	Claystone, grey, some green.
		sm.am.	Quartz; Limestone.
2137 - 2146	0.85	100%	Claystone, grey, some green/greenish light grey.
2146 - 2155	0.80	100%	Claystone, as above.
		sm.am.	Siltstone, brown, calcareous; Siltstone, light grey, glauconitic.
2155 - 2164	0.79	100%	Claystone, as above.
		obs.	Limestone, brown.
2164 - 2173	0.75	100%	Claystone, partly silty, as above.
		sm.am.	Sandstone, silty, light grey, glauconitic; Quartz Sand.

Depth (m)	TOC		Lithology.
2173 - 2182	0.83	100%	Claystone, grey, green and light grey observed.
		sm.am.	Sand/Siltstone, light grey, glauconitic.
2182 - 2191	0.75	85%	Claystone, partly silty, grey, some green/greenish.
		15%	Marl, light grey, slightly brownish.
		sm.am.	Quartz Sand, clear.
2191 - 2200	0.67	100%	Claystone, grey.
		sm.am.	Siltstone; Marl.
2200 - 2209	4.0	60%	Clayey Siltstone, calcareous, brownish light grey to light brown.
	0.95	40%	Claystone, grey.
		sm.am.	Pyrite.
2209 - 2218	2.42	65%	Clayey Siltstone, as above.
	0.82	35%	Claystone, as above.
2218 - 2227	3.38	80%	Clayey Siltstone, as above.
	0.82	20%	Claystone, as above.
2227 - 2236	0.91	100%	Claystone, grey, as above.
		sm.am.	Clayey Siltstone, as above.
2236 - 2245	0.88	90%	Claystone, as above.
		10%	Clayey Siltstone, as above.
2245 - 2254	0.67	75%	Claystone, as above.
		25%	Clayey Siltstone, as above.
2254 - 2263	0.60	100%	Claystone, grey, some green.
		sm.am.	Clayey Siltstone, as above.
2263 - 2272	0.65	100%	Claystone, grey.
		sm.am.	Sand.

Depth (m)	TOC		Lithology
2272 - 2281	1.30	100%	Claystone, light grey to grey, greenish, brownish, light green and light brown.
2281 - 2290		85%	Sand, fine to medium.
	0.67	15%	Claystone, grey, with arenaceous forams
		sm.am.	Coal; Pyrite; clayey Siltstone, browngrey.
2290 - 2299	0.72	95%	Claystone, partly silty, grey, light grey, some green.
		5%	Sand.
		sm.am.	Limestone, white; Pyrite.
2299 - 2308		60%	Sand, fine to medium, angular-subangular, light grey/white.
	0.49	50%	Claystone, grey, light browngrey.
2308 - 2317		80%	Sand, medium to very coarse, subangular to angular, light grey/white.
	0.62	20%	Claystone, grey, light grey, browngrey.
			Considerable amounts mud additives (lignite, coal).
2317 - 2326		95%	Sand, medium, fine, coarse, light grey/white.
	0.63	5%	Claystone.
			Mud additives (coal, lignite).
2326 - 2335		95%	Sand, fine to medium, coarse, angular, white.
	1.06	5%	Claystone.
2335 - 2344	1.12	95%	Claystone, light grey to grey, brownish, green.
		5%	Sand.
		sm.am.	Pyrite ; Mud additives (coal).

Depth (m)	TOC		Lithology
2344 - 2353	1.03	92%	Claystone, greenish grey, brownish grey, light grey, green.
		8%	Sand.
		sm.am.	Coal (mud additive); Pyrite.
2353 - 2362	1.01	100%	Claystone, grey to greenish grey and brownish, light grey, green.
		sm.am.	Coal; Pyrite; Sand.
2362 - 2371	0.82	100%	Claystone, as above, dark grey obs.
		sm.am.	Pyrite.
		obs.	Coal.
2371 - 2380	1.25	100%	Claystone, grey, greenish, light grey, brownish, green.
		obs.	Coal; Pyrite; Quartz.
2380 - 2389	1.41	100%	Claystone, grey, light grey, green.
2389 - 2398	1.03	100%	Claystone, silty, grey, some greengrey, brownish.
		sm.am.	Sand; Mica.
2398 - 2407	0.97	100%	Claystone, grey, brownish light grey, dark grey (micaceous), green.
		sm.am.	Sand.
		obs.	Pyrite, Mica.
2407 - 2416	0.85	100%	Claystone, grey, some green, light grey, brownish dark grey, (micaceous, silty) brownish grey.
		sm.am.	Silt/Clay; brownish grey, very micaceous; Quartz; Pyrite.
2416 - 2425	0.94	100%	Claystone, silty, grey, (brownish) light grey, green.
		sm.am.	Sand, with Quartz, Mica; Pyrite.

Depth (m)	TOC		Lithology
2425 - 2434	1.23	100%	Claystone, silty, partly grading to micaceous clayey Siltstone, grey to browngrey, some green, light brown.
		sm.am.	Sand; Mica; Pyrite.
2434 - 2443	1.00	100%	Claystone, grey, greenish, brownish.
		sm.am.	Siltstone, light brown, light grey; Sandstone/Sand; Pyrite.
		obs.	Limestone, brownwhite.
2443 - 2452	1.15	95%	Claystone, grey, brownish grey (silty, micaceous), greenish, some brownish light grey, light brown.
		5%	Sand/Sandstone.
		sm.am.	Mica; Pyrite; Limestone, white.
2452 - 2461	0.96	100%	Claystone, grey, partly micaceous and silty, some dark grey. The sample consists mostly of light grey cement (? casing).
2461 - 2470	1.24	100%	Claystone, partly grading to clayey Siltstone, grey, browngrey, light grey.
		sm.am.	Sand/Sandstone; Siltstone. The sample consists mostly of light grey cement (? casing).
2470 - 2479	2.09	100%	Claystone, partly grading to very micaceous clayey Siltstone, grey, brownish.
		sm.am.	Sandstone.
2479 - 2488	2.16	90 %	Claystone, silty, grey, brownish light grey, partly micaceous.
		10%	Sandstone, very fine.
		sm.am.	Siltstone; Limestone, white.

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Depth (m)	TOC		Lithology
2488 - 2497	2.05	100%	Claystone, grey, partly brownish, light grey.
2497 - 2506	1.99	90%	Claystone, silty, grey, brownish.
		10%	Sand and Sandstone, very fine, silty, some medium.
		sm.am.	Limestone, white.
2506 - 2515	2.06	100%	Claystone, grey (some micaceous), light grey, some Marl.
		sm.am.	Sandstone.
2515 - 2524	1.56	100%	Claystone, grey (some micaceous), light grey (marly), browngrey, brownish dark grey.
		sm.am.	Sandstone, light grey/white. Mud contaminated.
2524 - 2533	1.34	100%	Claystone, grey, some light brown.
2533 - 2542	1.28	100%	Claystone, grey, some brownish.
2542 - 2551		90%	Sand, fine to medium, very well sorted/well sorted, angular, some Mica, white.
		10%	Claystone, grey.
2551 - 2560		85%	Sand, as above.
	1.29	15%	Claystone, grey.
2560 - 2569		50%	Sand, as above.
	1.29	50%	Claystone, grey.
2569 - 2578		80%	Sand, as above.
	1.41	20%	Claystone, grey.
2578 - 2587		85%	Sand, as above.
	1.21	15%	Claystone, grey.

Depth (m)	TOC		Lithology
2587 - 2596		70%	Sand, as above.
	1.37	30%	Claystone, grey.
2596 - 2605	1.62	100%	Claystone, partly silty, grey (some micaceous), light grey to light brown (calcareous), dark grey, green observed.
		sm.am.	Siltstone and Sandstone; Sand.
2605 - 2614	1.40	100%	Claystone, grey, grading to brown, some calcareous light grey to light brown and grey.
		sm.am.	Sandstone.
2614 - 2623	1.20	100%	Claystone, grey, some browngrey.
		sm.am.	Sand/Siltstone, light grey.
2623 - 2632	1.41	100%	Claystone, grey, some brownish, some micaceous.
		sm.am.	Silt/Sandstone, light grey.
2632 - 2641	1.14	95%	Claystone, partly silty and micaceous, grey, light grey, some brownish, light brown.
		5%	Silt/Sandstone, light grey.
		obs.	Pyrite; Limestone, white.
2641 - 2650	1.12	95%	Claystone, partly silty, grey, brownish, micaceous, brownish light grey.
		5%	Sandstone and Siltstone.
2650 - 2659	1.45	85%	Claystone, silty, grey to browngrey Sand/Silt lamina obs, some light grey (calcareous).
		15%	Silt/Sandstone, light grey.
2659 - 2668	1.24	95%	Claystone, grey, brownish.
		5%	Silt/Sanstone, as above.
		sm.am.	Pyrite.

Depth (m)	TOC		Lithology
2668 - 2677	1.13	95%	Claystone, grey, partly brownish, light grey (Marl to calcareous Claystone).
		5%	Sand/Siltstone, as above.
2677 - 2686	1.32	95%	Claystone, grey, light grey (calcareous, Marl).
		5%	Silt/Sandstone.
2686 - 2695	1.15	75%	Claystone, grey.
		25%	Sandstone, light grey/white, very fine, calcareous cement.
2695 - 2704	1.80	65%	Claystone, grey, some brown.
		35%	Sandstone, very fine to fine, light grey/white, calcareous cemented.
2704 - 2713	0.94	90%	Claystone, grey, some micaceous.
		10%	Sandstone, as above, some micaceous.
2713 - 2722		85%	Sand, medium to very coarse, subangular-angular, white.
	1.04	15%	Claystone, as above.
2722 - 2731	1.38	95%	Claystone, grey.
		5%	Sand.
2731 - 2740		95%	Sand, fine to coarse, angular, white.
		5%	Claystone.
		sm.am.	Coal; Pyrite.
2740 - 2749		95%	Sand, as above.
		5%	Coal.
		sm.am.	Claystone.
2749 - 2758		100%	Sand, medium to very coarse, angular, white.
		sm.am.	Coal; Claystone.

Depth (m)	TOC		Lithology
2758 - 2767		95%	Sand, as above.
		5%	Coal.
		sm.am.	Claystone.
2767 - 2776		100%	Sand, as above.
		sm.am.	Coal; Claystone.
2776 - 2785		95%	Sand, as above.
		5%	Coal.
2785 - 2794		55%	Coal.
		35%	Sand, as above.
		10%	Claystone, grey to browngrey, dark grey.
2794 - 2803		55%	Coal.
		35%	Sand, medium to fine, some coarse.
		10%	Claystone, grey to brown, some light grey.
		sm.am.	Pyrite.
2803 - 2812		75%	Sand, as above.
		20%	Coal.
		5%	Claystone.
2812 - 2821		95%	Sand, white, medium to coarse.
		5%	Coal; Claystone.
2821 - 2830		90%	Sand, as above.
		5%	Coal.
		5%	Claystone.
2830 - 2839	1.54	95%	Claystone, grey to browngrey, dark grey.
		5%	Sand.
		sm.am.	Coal.
2839 - 2848	0.71	90%	Claystone, as above.
		10%	Sand.

Depth (m)	TOC		Lithology
2848 - 2857	0.56	90%	Claystone, grey to dark grey and browngrey.
		10%	Sand.
2857 - 2866		50%	Sand, medium to coarse, angular/ subangular, white.
	0.52	50%	Claystone, browngrey to dark grey.
2866 - 2875		90%	Sand, medium to very coarse.
		10%	Claystone, as above.
2875 - 2884		85%	Sand, as above.
	0.56	15%	Claystone, grey to browngrey.
2884 - 2893		100%	Sand, as above.
		sm.am.	Claystone; Pyrite.
2893 - 2902		100%	Sand, as above.
		sm.am.	Claystone; Coal; Pyrite.
2902 - 2911		100%	Sand, as above.
		sm.am.	Claystone.
2911 - 2920		97%	Sand, as above.
		3%	Claystone; Coal.
2920 - 2929		100%	Sand, as above.
		sm.am.	Claystone, grey, browngrey; Pyrite.
2929 - 2938		95%	Sand/Sandstone, as above.
		5%	Claystone, grey to browngrey.
2938 - 2947		50%	Sand, as above.
	1.07	50%	Claystone, as above.
		sm.am.	Coal; Pyrite.
2947 - 2956		100%	Sand, as above, some fine gravel.
		sm.am.	Claystone.

Depth (m)	TOC		Lithology
2956 - 2965		100%	Sand, as above.
		sm.am.	Claystone.
2965 - 2974		50%	Sand, medium to very coarse and Sandstone, fine, white.
	0.62	50%	Claystone, grey, light greygreen, redbrown, dark grey.
		sm.am.	Pyrite; Coal.
2974 - 2983		80%	Claystone, light green, redbrown, brownish grey/dark grey, yellow.obs
		20%	Sand/Sandstone.
		sm.am.	Pyrite.
2983 - 2992	0.58	70%	Claystone, as above, yellow grey (micaceous, silty).
		30%	Sand/Sandstone.
2992 - 3001		95%	Sand/Sandstone,
		5%	Claystone, redbrown, light green, yellow, grey.
		sm.am.	Coal.
3001 - 3010		93%	Sand/Sandstone, fine to very coarse white.
		7%	Claystone, as above.
3010 - 3019		60%	Sand/Sandstone, as above.
	0.78	40%	Claystone, as above, dark grey.
3019 - 3028	0.30	92%	Claystone, redbrown, light green, grey, yellow, dark grey.
		8%	Sandstone.
3028 - 3037	0.40	95%	Claystone, redbrown, light green, some grey and yellow.
		5%	Sand/Sandstone.
		sm.am.	Limestone, white.

Depth (m)	TOC		Lithology
3037 - 3046	0.35	100%	Claystone, as above.
		sm.am.	Sandstone, calcareous cement, white; Limestone, white.
3046 - 3055	0.34	75%	Claystone, redbrown, green, grey, yellow,
		25%	Sand/Sandstone, as above.
		sm.am.	Limestone, white; Coal; Pyrite.
3055 - 3064		75%	Sandstone, fine to medium, calcareous cement, white.
	0.51	25%	Claystone, as above.
		sm.am.	Limestone, white.
3064 - 3073		90%	Sand, medium to coarse, angular white.
	0.62	10%	Claystone, as above.
		sm.am.	Limestone.
3073 - 3082		75%	Sand, as above and Sandstone, fine.
	0.40	25%	Claystone, redbrown, grey (partly micaceous), green, yellow.
		sm.am.	Pyrite; Coal.
3082 - 3091	0.50	75%	Claystone, redbrown, green, brown, grey and brownish grey.
		25%	Sand and Sandstone, as above.
		sm.am.	Coal; Limestone.
3091 - 3100		80%	Sand, medium, angular, white.
	0.54	20%	Claystone, as above.
		sm.am.	Pyrite; Mica.
3100 - 3109	0.38	80%	Claystone, redbrown, greygreen to green, browngrey, grey.
		20%	Sand/Sandstone.
		sm.am.	Limestone, white.

Depth (m)	TOC		Lithology.
3109 - 3118	0.63	95%	Claystone, redbrown, grey to browngrey, some green, yellow.
		5%	Sand/Sandstone.
		sm.am.	Coal; Limestone.
3118 - 3127	0.73	100%	Claystone, redbrown, green, grey (micaceous), browngrey.
		sm.am.	Coal; Sandstone.
3127 - 3136	0.78	90%	Claystone, as above.
		10%	Coal.
		sm.am.	Sandstone.
3136 - 3145		90%	Sand/Sandstone, medium to fine, some coarse.
	0.65	10%	Coal.
		sm.am.	Claystone, as above; Limestone.
3145 - 3154		55%	Sand/Sandstone, as above.
	0.65	30%	Claystone, redbrown, grey to browngrey, green, some yellow.
		15%	Coal.
3154 - 3163		75%	Sand/Sandstone, medium, some fine and coarse.
	0.50	20%	Claystone, redbrown, green, some grey, yellow.
		5%	Coal.
3163 - 3172	0.87	95%	Claystone, as above.
		5%	Coal; Sand/Sandstone.
3172 - 3181	0.51	85%	Claystone, redbrown, light green to greenish light grey, (brownish) grey (micaceous).
		15%	Coal.
		sm.am.	Sand/Sandstone.

TABLE III

Weight (mg) of EOM and chromatographic fractions.

IKU No	Depth(m)	Rock ext(g)	EOM(mg)	Sat(mg)	Aro	HC	Non HC	TOC
K697	1580-1610	100.0	84.9	0,8	2.7	3.5	38.3	1.58
806	1750-80	59.24	104.0	8.4	20.8	29.2	11.1	0.63
809	1840-49	12.4	25.9	7.5	6.4	13.9	5.5	1.33
813	1876-85	45.41	269.3	41.2	88.9	130.1	27.6	1.69
815	1894-1903	58.4	190.5	66.1	46.5	112.6	51.1	1.07
818	1921-30	57.20	100.1	7.1	15.2	22.3	7.6	0.61
825	1975-84	37.02	319.3	86.6	95.8	182.4	32.1	1.50
831	2029-38	87.29	259.6	89.7	79.5	169.2	29.1	1.19
834	2056-65	88.0	178.8	69.2	39.8	109.0	17.9	1.22
838	2092-2101	57.80	90.3	7.3	9.3	16.6	7.5	0.59
843	2137-46	45.56	89.4	6.-	6.0	12.0	8.3	0.85
849	2191-2210	52.42	114.3	15.8	17.0	32.8	8.1	0.67
853	2227-36	23.5	113.6	40.3	31.7	72.0	18.4	0.91
858	2272-81	51.11	285.2	76.9	85.4	162.3	4.3	1.30
865	2335-44	50.1	74.4	20.4	23.7	44.1	15.1	1.12
872	2380-89	55.-	71.8	18.5	21.0	39.5	15.3	1.41
879	2443-52	15.5	19.5	5.4	4.7	10.1	5.6	1.15
883	2479-88	53.6	73.4	24.1	25.0	49.1	18.2	2.16
886	2506-15	93.5	129.8	46.8	29.9	76.7	20.0	2.06
894	2569-78	52.4	43.3	8.7	10.7	19.4	11.3	1.41
898	2605-14	73.5	99.4	38.3	30.0	68.3	19.5	1.40
906	2677-86	40.9	99.2	36.8	23.5	60.3	20.6	1.32
946	2830-39	67.5	55.9	10.8	15.4	26.2	16.4	1.54
978	3118-27	28.1	13.5	1.7	3.9	5.6	6.0	0.73
983	3163-72	64.3	10.7	2.9	3.1	6.0	4.5	0.87

TABLE IV

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS (weight ppm of rock)

IKU No.	Depth (m)	EOM	SAT	Aro	Total hydrocarb.	Non hydrocarb.
K.697	1580-1610	849	8	27	35	383
806	1750-80	1755	141	351	493	187
809	1840-49	2048	604	516	1121	443
813	1876-85	5930	907	1957	2865	607
815	1894-1903	3261	1131	796	1928	875
818	1921-30	1750	124	265	389	132
825	1975-84	8625	2339	2587	4927	867
831	2029-38	2973	1027	910	1938	333
834	2056-65	2031	786	452	1238	203
838	2092-2101	1562	126	160	287	129
843	2137-46	1962	131	131	263	182
849	2191-2200	2180	301	324	625	154
855	2227-36	4834	1714	1348	3063	782
858	2272-81	5580	1505	1671	3176	84
865	2335-44	1485	407	473	880	301
872	2380-89	1305	336	381	718	278
879	2443-52	613	348	303	652	361
883	2479-88	1369	450	466	916	340
886	2506-15	1388	501	320	820	214
894	2569-78	826	166	204	370	216
898	2605-14	1352	521	408	929	265
906	2677-86	2425	900	575	1474	504
946	2830-39	828	160	228	388	243
978	3118-27	480	61	139	199	214
983	3163-72	166	45	48	93	70

TABLE V

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS (mg/g/TOC).

IKU No.	Depth (m)	EOM	SAT	Aro	Total hydrocarb.	Non hydrocarb.
K.697	1580-1610	53.-	0.-	1.	2.-	24.-
806	1750-80	278.-	22.-	55.	78.-	29.-
809	1840-49	154.-	45.-	38.	84.-	33.-
813	1876-45	350.-	53.-	115.	169.-	35.-
815	1894-1903	304.-	105.-	74.	180.-	81.-
818	1921-30	286.-	20.-	43.	63.-	21.-
825	1975-84	575.-	155.-	172.	328.-	57.-
831	2029-38	249.-	86.-	76.	162.-	28.-
834	2056-65	166.-	64.-	37.	101.-	16.-
838	2092-2101	264.-	21.-	27.	48.-	21.-
843	2137-46	230.-	15.-	15.	30.-	21.-
849	2191-2200	325.-	44.-	48.	93.-	23.-
853	2227-37	531.-	188.-	148.	336.-	86.-
855						
858	2272-81	429.-	116.-	129.-	244.-	6.-
865	2335-44	133.-	36.-	42.-	79.-	27.-
872	2380-89	93.-	24.-	27.-	51.-	20.-
879	2443-52	53.-	30.-	26.-	57.-	31.-
883	2479-88	63.-	21.-	22.-	42.-	16.-
886	2506-15	67.-	24.-	16.-	40.-	10.-
894	2569-78	59.-	12.-	14.-	26.-	15.-
898	2605-14	97.-	37.-	29.-	66.-	19.-
906	2677-86	184.-	68.-	44.-	112.-	38.-
946	2830-39	54.-	10.-	15.-	25.-	16.-
978	3118-27	66.-	8.-	19.-	27.-	29.-
983	3163-72	19.-	5.-	6.-	11.-	8.-

TABLE VI

COMPOSITION IN % OF THE MATERIAL EXTRACTED FROM THE ROCK

IKU No.	Depth (m)	Sat / EOM	Aro / EOM	HC / EOM	Sat / Aro	Non HC / EOM	HC / Non HC
697	1580-1610	0	3	4	29	45	9
806	1750-80	8	20	28	40	10	263
809	1840-49	29	25	54	117	21	252
813	1876-85	15	33	48	46	10	471
815	1894-1903	34	24	59	142	26	220
818	1921-30	7	15	22	46	7	293
825	1975-84	27	30	57	90	10	568
831	2029-38	34	30	65	112	11	581
834	2056-65	38	22	60	173	10	608
838	2092-2101	8	10	18	78	8	221
843	2137-46	6	6	13	100	9	144
849	2191-2200	13	14	28	92	7	404
853	2227-36	35	27	63	127	16	391
858	2272-81	27	30	57	90	2	3774
865	2335-44	27	32	59	86	20	292
872	2380-89	26	29	55	88	21	258
879	2443-52	27	24	51	115	29	180
883	2479-88	33	34	67	96	25	270
886	2506-15	36	23	59	157	15	384
894	2569-78	20	25	45	81	26	172
898	2605-14	39	30	69	128	20	350
906	2677-86	37	24	61	157	21	293
946	2830-39	19	28	47	70	29	160
978	3118-27	13	29	41	44	44	93
983	3163-72	27	29	56	94	42	133

TABLE VII

Tabulation of datas from the gaschromatograms.

	Depth(m)	Pristane/nC_{17}	Pristane/Phytane	CPI
K697	1580-1610	1.41	0.50	NDP
806	1750-1780	1.95	1.35	NDP
809	1840-49	1.52	1.56	NDP
813	1876-85	1.06	2.60	NDP
815		0.90	1.70	NDP
818	1921-30	0.78	2.50	NDP
825	1975-84	1.20	1.55	1.1
831	2029-38	0.87	1.59	1.1
834	2056-65	0.56	1.56	1.1
838	2092-2101	0.72	1.54	1.1
843	2137-46	0.70	1.52	1.1
849	2191-2200	0.69	1.50	1.1
853	2227-36	0.70	1.46	1.1
858	2272-81	0.70	1.60	1.1
865	2335-44	0.54	1.46	1.1
872	2380-89	0.65	1.61	1.2
879	2443-52	0.61	1.58	1.2
883	2479-88	0.90	1.67	1.2
886	2506-15	0.75	1.50	NDP
894	2569-78	0.76	2.15	1.7
898	2605-14	0.63	1.60	1.8
906	2677-86	0.60	1.32	NDP
946	2830-39	1.35	2.93	1.7
978	3118-27	1.42	2.65	1.5
983	3163-72	0.87	2.08	1.4

Table VIII

VITRINITE REFLECTANCE AND VISUAL KEROGEN MEASUREMENTS

Depth (m)	Vitrinite reflectance	Color index	Type of organic matter
1490-1520	0.38(22)	2-	Am/W, Coal R !
1670-1700	0.39(19)	2-/2	Am/W, He, Coal R !
1840-1870	0.45(20)	2-/2(1740-1870)	Am/He, W
1894*	0.30(3) 0.56(2)	2-/2	Am/He
1951*	0.44(10)	2/2+	Am/He
1997*	0.30(8) 0.61(1)	2	Am/He
2051*	0.43(4)	2	Am/He, Coal R !
2095*	0.48(9) 0.67(6)	2	Am/W, Coal R !
2145*	0.43(5)	2	Am, Cysts/W, He, Poll-spor (Mudadd/Coal R! 30%)
2193*	0.44(14) 0.84(1)	2/2+	Am, Custs/Coal R!, W, He, Poll-spor
2207*	0.40(2) 0.71(3) 1.00(5)	2/2+	Am/He, Coal R !
2270*	0.39(22)	2/2+	Am/He, W, Coal R !, Poll-spor
2308*	0.43(21)	2/2+	Am, W, Poll-spor
2393*	0.38(22)	3-	Am, Cysts/Cut, W, Poll-spor, Coal
2456*	0.36(21)	2+	Am/He, W
2535.5*	0.48(22)	2+	Am/He, Poll-spor
2602*	0.50(21)	2+	Am/Cysts, He, W
2685*	0.42(20) 0.72(1)	2+/3-	Am, Cysts/He, poll-spor
2711*	0.49(19)	2+/3-	Am/He
2840*	N.D.	3/3+	Am/He
2961*	N.D.	Barren	
3014*	N.D.	2+/3-	Am/He, Coal
3124*	0.33(1) 0.69(2) 0.95(1)	2+/3-	Am, He
3156.3*	0.58(1)	2+/3-	Am
3172-3181	0.42(20) 1.03(2)	?R 3+	W/He, Am

TABLE IX Rock Eval Results.

Sample	Depth	C_{org} %	S_1 mg/g of rock	S_2 mg/g of rock	S_3 mg/g of rock	Hydrogen Index	Oxygen Index	Oil of bas content $(S_1 + S_2)$	Production Index $\frac{S_1}{S_1 + S_2}$	Tmax
K695	1520-1550	1.71	0.2	2.1	0.9	123	53	2.3	0.09	419
697	1580-1610	1.58	0.0	1.5	1.0	95	63	1.5	----	423
700	1670-1700	1.07	0.1	0.6	1.9	56	178	0.7	0.14	416
806	1750-1780	0.63	0.1	0.2	0.7	32	111	0.3	0.33	407
809	1840-1849	1.33	0.1	1.9	0.8	143	60	2.0	0.05	427
813	1876-1885	1.69	0.8	3.2	0.7	189	41	4.0	0.20	424
818	1921-1930	0.61	0.0	0.4	0.4	66	66	0.4	----	422
823	1957-1966	1.57	2.5	3.8	1.5	242	96	6.3	0.40	424
826	1984-1993	1.31	2.3	3.7	1.0	289	76	6.0	0.38	422
830	2020-2029	1.41	0.5	2.9	0.9	206	64	3.4	0.15	423
833	2047-2056	1.47	0.7	3.4	1.0	231	68	4.1	0.17	426
834	2056-2065	1.22	0.2	2.1	1.2	172	98	2.3	0.09	426
835	2065-2074	0.74	0.1	0.6	0.9	81	122	0.7	0.14	425
836	2074-2083	0.54	0.1	0.3	0.8	56	148	0.4	0.25	425
840	2110-2119	0.73	0.1	0.4	0.5	55	68	0.5	0.20	428
843	2137-2146	0.85	0.1	0.7	0.6	82	71	0.8	0.13	423
847	2173-2182	0.83	0.1	0.5	0.3	60	36	0.6	0.17	427
850	2200-2209	0.95	0.3	0.6	0.3	63	32	0.9	0.33	425
853	2227-2236	0.91	0.1	0.9	0.4	100	44	1.0	0.10	424
855	2245-2254	0.60	0.1	0.2	0.4	73	67	0.3	0.33	421
858	2272-2281	1.30	0.3	1.4	0.7	108	54	1.7	0.18	423

TABLE IX

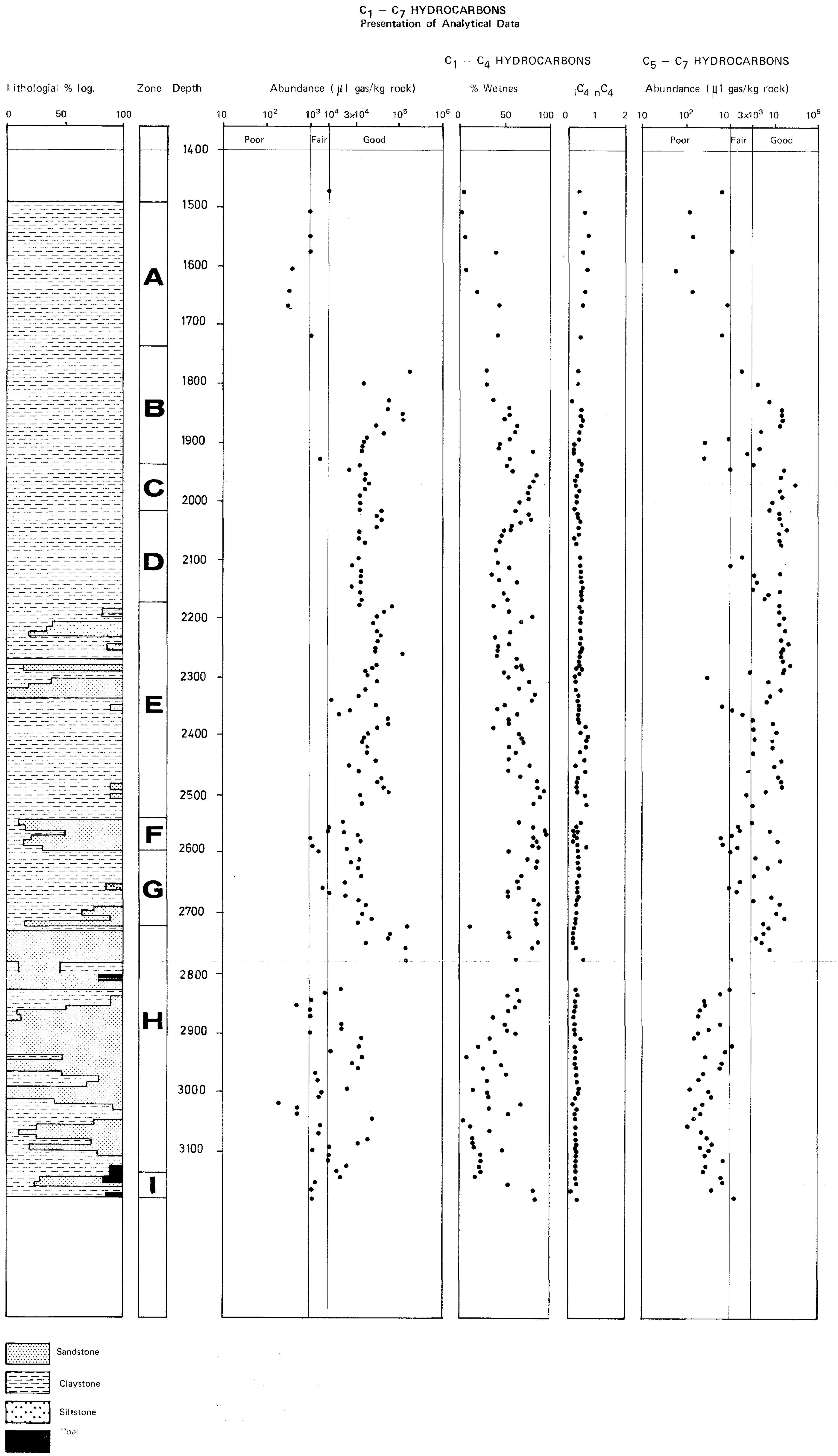
Sample	Depth	C_{org} %	S_1 mg/g of rock	S_2 mg/g of rock
860	2290-2299	0.72	0.1	0.6
865	2335-2344	1.12	0.2	1.0
869	2353-2362	1.01	0.1	1.1
871	2371-2380	1.25	0.2	0.9
872	2380-2389	1.41	0.5	1.5
876	2416-2425	0.94	0.1	0.5
877	2425-2434	1.23	0.2	0.9
879	2443-2452	1.15	0.2	1.4
881	2461-2470	1.24	0.2	2.1
882	2470-2479	2.09	0.5	4.3
884	2488-2497	2.05	0.7	5.7
886	2506-2515	2.06	0.4	5.5
888	2524-2533	1.34	0.2	2.2
890	2533-2542	1.28	0.2	1.9
897	2596-2605	1.62	0.4	3.2
898	2605-2614	1.40	0.5	2.3
900	2623-2632	1.41	1.1	2.9
903	2650-2659	1.45	0.3	2.8
906	2677-2686	1.32	1.3	3.2

Rock Eval Results.

S_3 mg/g of rock	Hydrogen Index	Oxygen Index	Oil of bas content $(S_1 + S_2)$	Production Index $\frac{S_1}{S_1 + S_2}$	Tmax
0.5	83	69	0.7	0.14	424
0.9	89	80	1.2	0.17	427
0.6	109	59	1.2	0.08	423
0.5	72	40	1.1	0.18	427
0.8	106	57	2.0	0.25	427
0.6	53	64	0.6	0.17	430
0.3	73	24	1.1	0.18	427
0.4	122	35	1.6	0.13	426
0.8	169	65	2.3	0.09	429
1.8	206	86	4.8	0.10	427
0.9	278	44	6.4	0.11	428
0.8	267	39	5.9	0.07	431
0.5	164	37	2.4	0.10	431
0.7	148	55	2.1	0.10	431
0.4	200	25	3.6	0.11	431
1.4	164	100	2.8	0.18	427
1.4	206	100	4.0	0.28	425
0.5	193	34	3.1	0.10	432
1.6	242	121	4.5	0.29	421

Sample	Depth	C_{org} %	S_1 mg/g of rock	S_2 mg/g of rock
908	2695-2704	1.80	0.4	5.4
909	2704-2713	0.94	0.2	1.5
934	2722-2731	1.38	0.3	2.7
946	2830-2839	1.54	0.3	3.3
947	2839-2848	0.71	0.1	0.5
948	2848-2857	0.56	0.0	0.3
963	2983-2992	0.58	0.1	0.4
966	3010-3019	0.78	0.1	0.7
967	3019-3028	0.30	0.0	0.0
968	3028-3037	0.40	0.0	0.1
974	3082-3091	0.50	0.1	0.3
976	3100-3109	0.38	0.0	0.2
977	3109-3118	0.63	0.1	0.4
983	3163-3172	0.87	0.1	0.7
984	3172-3181	0.51	0.1	0.2

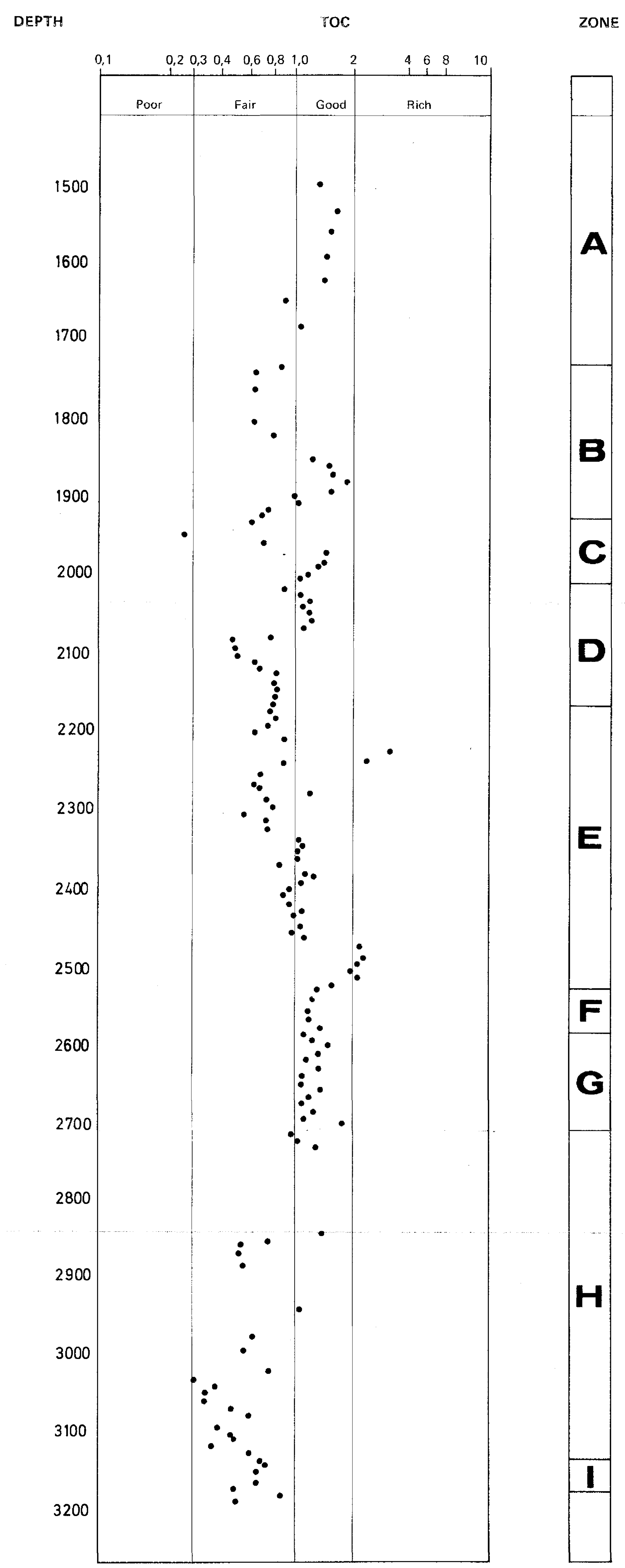
S_3 mg/g of rock	Hydrogen Index	Oxygen Index	Oil of bas content $(S_1 + S_2)$	Production Index $\frac{S_1}{S_1 + S_2}$	Tmax
0.4	300	22	5.8	0.07	431
0.7	160	74	1.7	0.12	427
0.4	196	29	3.0	0.10	431
0.4	214	26	3.6	0.08	431
0.4	70	56	0.6	0.17	430
0.4	54	71	0.3	-	428
0.5	69	86	0.5	0.20	431
0.5	90	64	0.8	0.13	431
0.6	-	200	0.0	-	424
0.6	25	150	0.1	-	420
0.6	60	120	0.4	0.25	432
0.5	52	132	0.2	-	432
0.6	63	95	0.5	0.20	430
0.5	80	57	0.8	0.13	430
0.2	39	39	0.3	0.33	429



C1 – C7 HYDROCARBONS
Presentation of Analytical Data
C1 – C4 HYDROCARBONS
C5 – C7 HYDROCARBONS
Lithologial % log.
Zone
Depth
Abundance (µl gas/kg rock)
% Wetnes
iC4 nC4
Abundance (µl gas/kg rock)
Poor
Fair
Good
A
B
C
D
E
F
G
H
I
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
Sandstone
Claystone
Siltstone

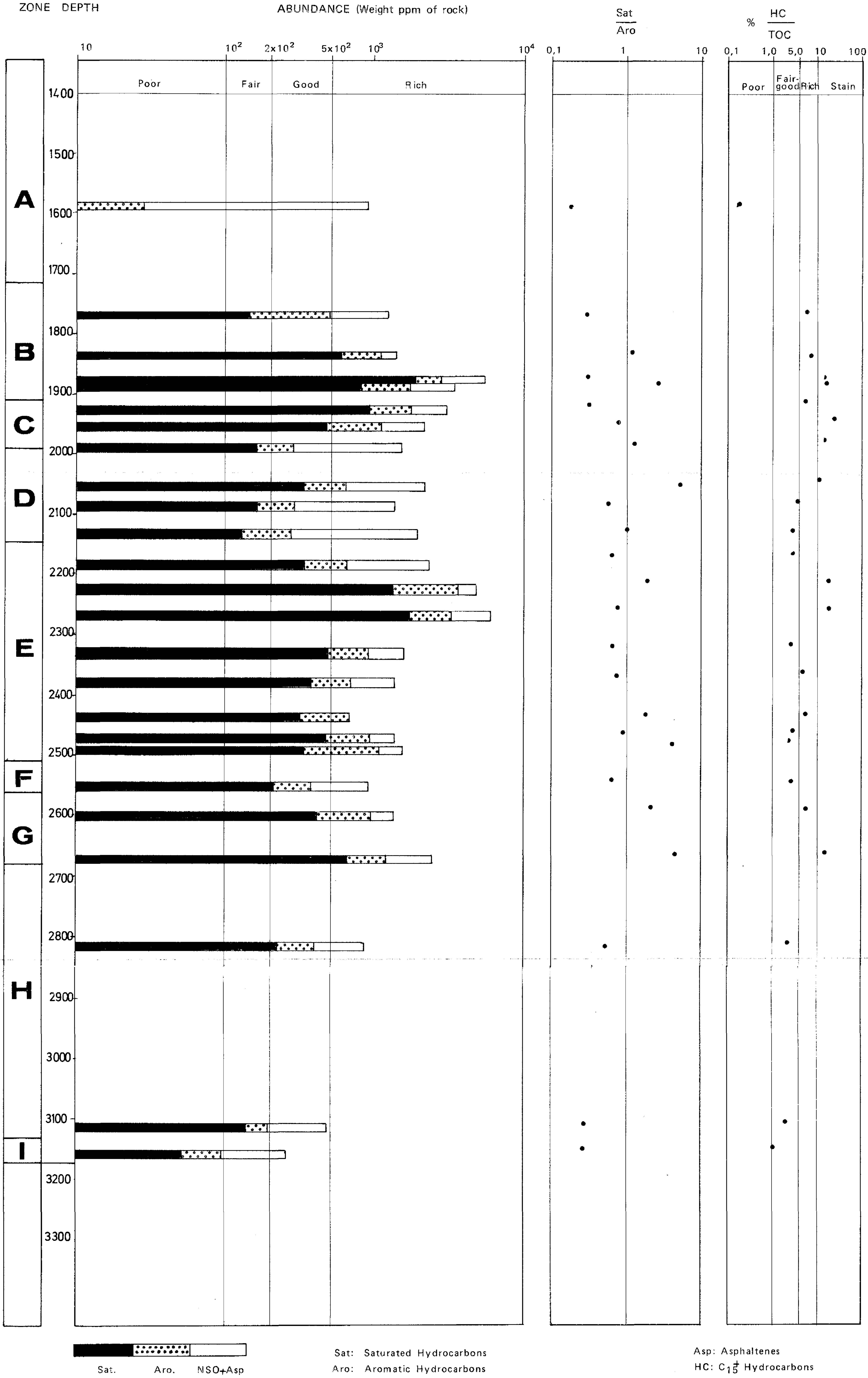
TOTAL ORGANIC CARBON (TOC)

Presentation of Analytical Data



C_{15}^{+} HYDROCARBONS

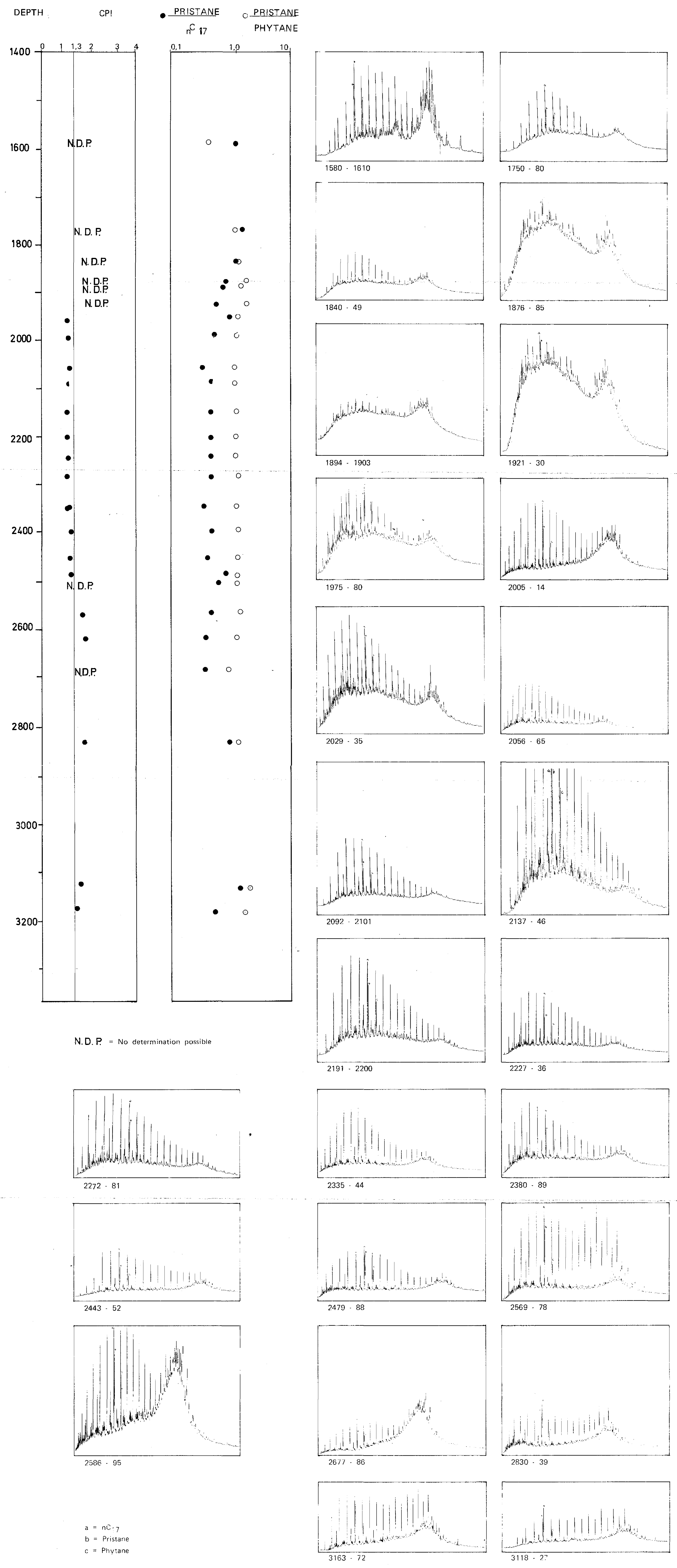
Presentation of Analytical Data

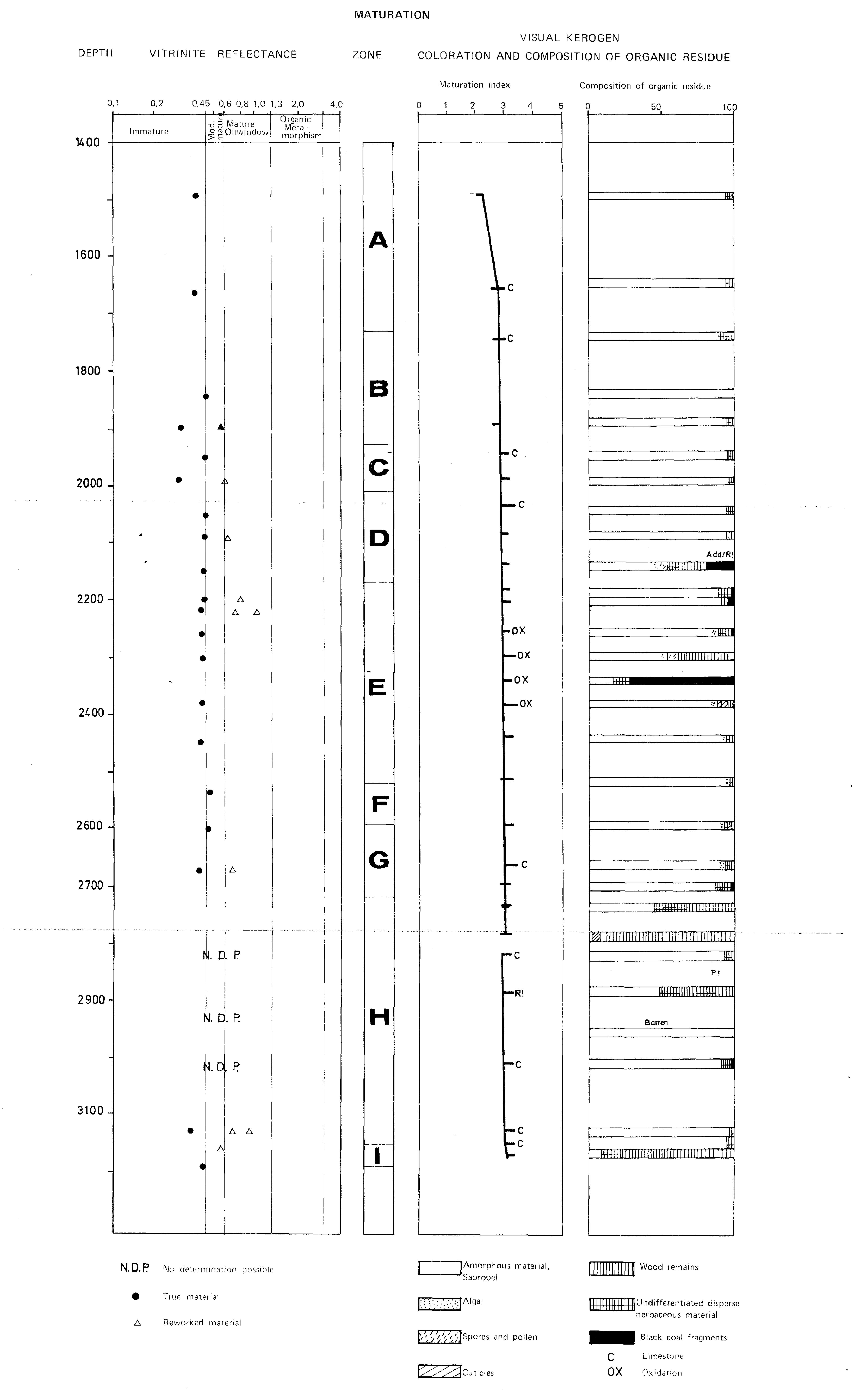


Sat: Saturated Hydrocarbons
Aro: Aromatic Hydrocarbons
NSO: Nitrogen, Sulphur and Oxygen containing compounds

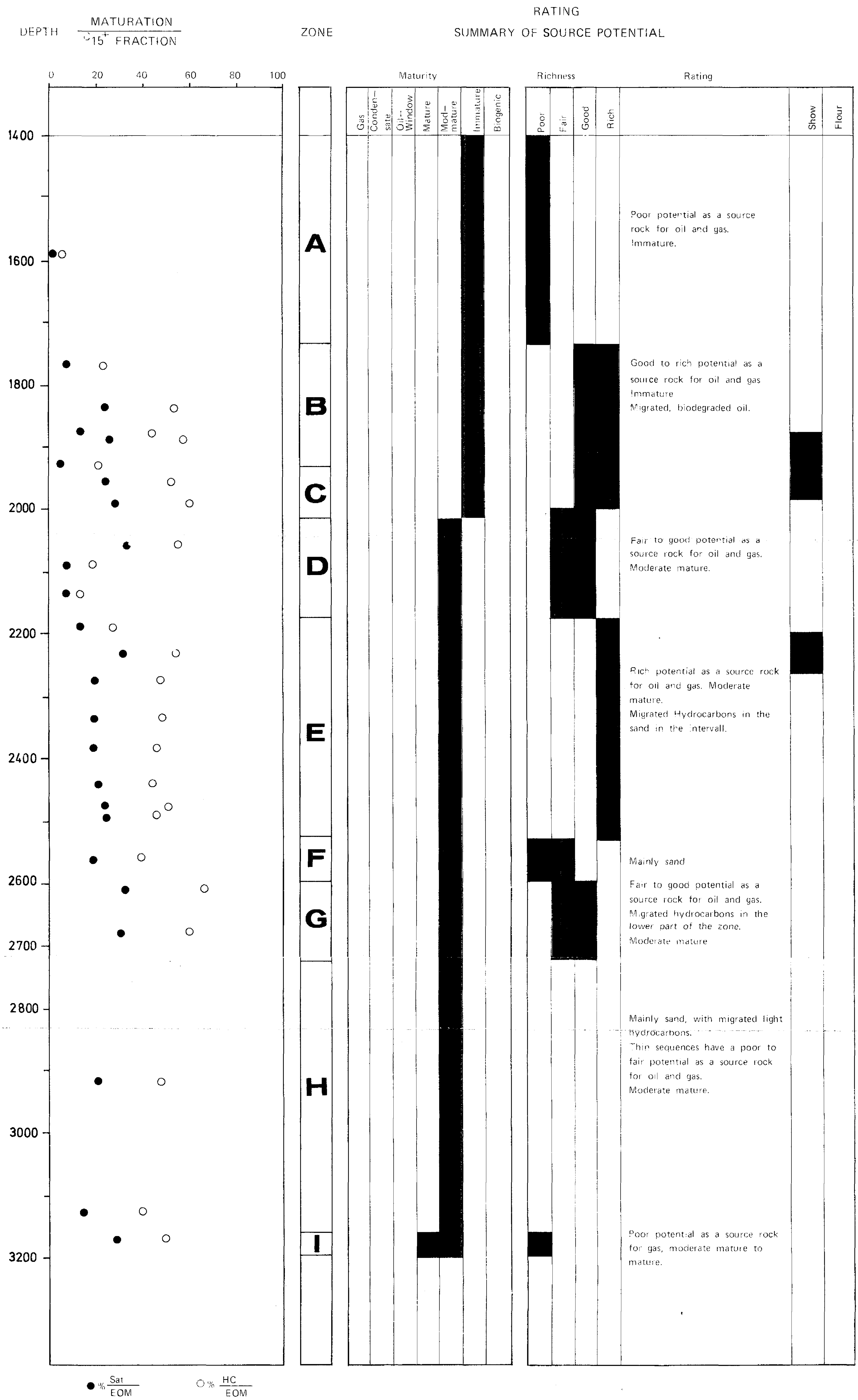
Asp: Asphaltenes
HC: C_{15}^{+} Hydrocarbons
TOC: Total Organic Carbon

C_{15}^{+} SATURATED HYDROCARBONS




MATURATION
DEPTH
VITRINITE REFLECTANCE
ZONE
VISUAL KEROGEN
COLORATION AND COMPOSITION OF ORGANIC RESIDUE
Maturation index
Composition of organic residue
0,1 0,2 0,45 0,6 0,8 1,0 1,3 2,0 4,0
Immature
Mod. mature
Mature Oilwindow
Organic Meta-morphism
0 1 2 3 4 5
0 50 100
1400
1600
1800
2000
2200
2400
2600
2700
2900
3100
A
B
C
D
E
F
G
H
I
C
OX
R!
Add/R!
P!
Barren
N. D. P.
N.D.P No determination possible
True material
Reworked material
Amorphous material, Sapropel
Algal
Spores and pollen
Cuticles
Wood remains
Undifferentiated disperse herbaceous material
Black coal fragments
C Limestone
OX Oxidation

INTERPRETATION DIAGRAM



Sat: Saturated Hydrocarbons
HC: Hydrocarbons
EOM: Extractable Organic Matter

Rock - Eval Pyrolysis